THE CULTIVATOR:

A MONTHLY PUBLICATION, DEVOTED TO AGRICULTURE.

I KNOW OF NO PURSUIT IN WHICH MORE REAL AND IMPORTANT SERVICES CAN BE RENDERED TO ANY COUNTRY, THAN BY IMPROVING ITS AGRICULTURE.—*Wash.*

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THE CULTIVATOR.

TO IMPROVE THE SOIL AND THE MIND.

☞ The engagements of the Conductor rendering it necessary that he should be absent during the first part of October, the next number of the Cultivator will be published on the first of November, and not on the 15th October, as heretofore proposed.

The Crops

Are represented to be unusually abundant throughout our whole land, with some partial exceptions; and the probability is, that we shall have a large surplus of all the productions of agriculture. Prices will therefore ultimately depend upon the extent of a foreign demand. Wheat is already selling in the western states at 62½ to 75 cents per bushel, and the expectation is entertained that prices will fall. This, as we have remarked, will depend on the foreign demand. While, therefore, we would recommend to the farmer, to sell at a fair remunerating price, we would not advise him to be frightened into a low price, by the representations of interested speculators. And as it requires more fortitude, or philosophy, to combat prosperity, than it does adversity, we advise the farmer to remember the fable of the milk-maid, who counted her chickens before they were hatched—not to run in debt on the strength of his abundant crops, till he realizes the amount of his actual sales.

There are, as we have observed, some drawbacks. Wheat has been seriously injured by rust, in many districts, particularly late sown spring wheat, many fields have not paid for harvesting, and other fields have not been harvested. We sowed some handsome varieties of foreign seed wheat, about the 15th May, and sowed our Italian at the same time, and in the same field.—The latter was somewhat injured by rust, while the new foreign varieties were virtually destroyed by it.

Indian corn, in some places, suffered by frost in August, and in many other places, and more severely, by the frosts of the middle of September. As the season has been much later than usual, it is feared this crop will prove very deficient, and defective in quality.

Hints for the Season.

"Like produces like," is an accredited maxim among farmers. Hence he who wishes to rear fine animals, should take care to secure good breeders, and he that would raise fine grain and roots, should take care to save, or procure, good seed, in time. This is the season to attend to these matters, particularly in regard to seed corn. If it has not already been done, no time should be lost in selecting the earliest and finest ears of corn, twin ears if you please, of stripping off most of the husks, of braiding, or wristing them, and hanging them in an airy loft to dry. Seed corn should never be suffered to go into a pile with the main crop, as it may heat, or mould, and lose its germinating principle. If the corn has been cut up and stooked, the early ripened ears may be readily distinguished, when the crop is gathered, by the colour of the husks and brightness of the grain.

The admonition which we give extends alike to other farm, and to garden seeds; and in regard to the latter, it may be remarked, that they keep better in their capsules, or seed vessels, than otherwise, provided they are kept dry.

Steeping seed wheat, and other small grains, in pickle, serves two, if not three good purposes. 1. The light and imperfect grains will float, and may be skimmed off. 2. It will prevent the crop being smutty; and 3. It will insure a more prompt and even germination. And if the seed is afterwards limed, before it is sown, as it should be, it will tend to preserve it from the attacks of insects. As a covering of one inch is thought sufficient for seeds that have been acclimated, covering with the harrow is deemed better than covering with the plough. "The wheat produced after the land has been limed, is believed to be thinner skinned, and to yield more good meal, than other wheat, and to make better bread."

To secure the best kinds of seed, of garden products, the most healthy plants must be chosen, and those which are most early in respect to the season; these should be so insulated, as to have no weak plants of the same species, or even genus, in their vicinity, lest the fecundating dust of weaker plants should be blown by the winds upon the stigma of the stronger, and thus produce a less vigorous progeny.

To collect good seeds, consists not in procuring new seeds from distant places, as is generally supposed, but in selecting the best seeds and roots of your own. This rule was practised successfully by the late Joseph Cooper, of N. J. who thus continued to propagate from his own seed for many years, with manifest advantage. We, however, think there are exceptions to the rule, in the potato and other crops where it is difficult, if not impossible, to make the required selection. In saving his radish seed, Mr. Cooper took ten or twelve that he most approved of, and planted them at least one hundred yards from others that blossomed at the same time. In the same manner he treated all his other plants, varying the circumstances according to their nature.

Seeds retain their vegetating principle for a greater or less length of time, according to the manner of their being kept, and according to their structure and properties. Thin seeds, as the carrot, parsnip, lettuce, &c. cannot be depended on after they are a year old. Peas and English beans will germinate well, it is said, at seven years old, while our common garden bean will seldom do well after the first year. Cucumbers, melons, squashes and pumpkins, are said to improve to the fifth, sixth and seventh year—the older the seeds are, the less the plants run to vine, and the more to fruit. Seeds have been made to vegetate and grow which have been one hundred years old, by the use of oxygenated muriatic acid and water.

To preserve seeds they should be kept dry, and kept alike from great heat and great cold. To transport them with safety a great distance, and especially to or from a tropical climate, the practice has been successful of mixing them with brown sugar, or with charcoal dust, or with raisins, in a close vessel.

All seeds should be sown when the soil is just ploughed or dug, as by these operations much atmospheric air is buried, which is essential to the germinating process; and the ground is withal moist, another requisite to quick growth.

The Pageantry of Republics.

To maintain republican principles and a republican government, it is necessary that we preserve republican habits and customs. We affect to hate kings, yet we worship men. We affect to be free, yet we glory in being the slaves of party. We profess toleration, yet we proscribe, as unworthy of public confidence, the brother who dissents from our political creed, or who refuses to support our candidate, be he ever so bad.—We are republicans by profession, but aristocrats or sycophants in practice.

Our news journals, for the last two months, have been filled with accounts of pageant processions, laudatory addresses, and sumptuous entertainments, got up, ostensibly, in honor of distinguished citizens, whose duties or pleasures have induced them to travel abroad. Thousands, many thousands, have been expended, a vast deal of time has been wasted, and some of the more dangerous of the human passions invoked, in getting up these shows,—not so much, we suspect, with the view of doing real honor to the individuals, as of strengthening the interests of party, and subserving the sinister purposes of individuals. As republicans, we ridicule the adulatory homage paid to the crowned heads and privileged classes of Europe, by what we term an ignorant and enslaved population; and yet we outstrip them in indiscriminate and fulsome panegyric, and partizan worship. Our constitution and laws regard public officers as public servants, not elevated for their own, but for the public good; yet, in our practice, we treat them as our masters, and it would be no wonder, such is human propensity to abuse power, if they soon assumed to be such. Rome granted triumphs to her distinguished men; and these distinguished men became her masters. Elections by the legitimate authorities soon ceased to be voluntary; and Cæsars were raised up, by the tumultuous acclamations of the mob, or the army, to curse and enslave the republic.

We would by no means withhold, from public officers, the respect due to their stations, nor from distinguished individuals, the honor due to their merits. We would as cordially tender our hand, and our respects, to merit, as any man, yet we verily think, that this respect and this honor would be more compatible with our republican professions, less derogatory to our dignity as freemen, and equally complimentary to those whom we would honor, if processions, cavalcades and military parade were dispensed with. It is but too apparent, that these pageants are got up for party, and not for public benefit; and that if tolerated, they will increase in frequency and in mischief. It is not the evils that have happened that we so much deprecate, but the evils that are likely to grow out of these anti-republican precedents. It should be a man's virtues, his public services, and his fidelity to our republican institutions, that should recommend him to public confidence and support—and these are likely to be known whenever they are developed—and not the number of partisans which can be drummed up to swell his cavalcade. A good man needs not these extraneous anti-republican contrivances, and a bad man is certainly not entitled to them.

We intend no political or personal allusions in these remarks. We consider the practice a bad one, inconsistent with our republican professions, one that is growing upon us, and one that should be discountenanced by the sober, reflecting part of the community.

Schools of Agriculture.

When we consider that agriculture is the great business of the nation—of mankind;—that its successful prosecution depends upon a knowledge, in the cultivators of the soil, of the principles of natural science—and that *our* agriculture stands in special need of this auxiliary aid—we cannot withhold our surprise and regret, that we have not long since established professional schools, in which our youth, or such of them as are designed to manage this branch of national labor, might be taught, simultaneously, the principles and practice of their future business of life, and on which, more than on any other branch of business, the fortunes of our country, moral, political and national, essentially depend. We require an initiatory study of years, in the principles of law and medicine, before we permit the pupil to practise in these professions. We require a like preliminary study in our military and naval schools, in the science of war and of navigation, ere the student is deemed qualified to command. And yet, in agriculture, by which, by the permission of Providence, we virtually "live, and move, and have our being," and which truly embraces a wider range of useful science, than either law, medicine, war or navigation, we have no schools, we give no instruction, we bestow no governmental patronage. Scientific knowledge is deemed indispensable in many minor employments of life; but in this great business, in which its influence would be most potent and useful, we consider it, judging from our practice, of less consequence than the fictions of the novelist. We regard mind as the efficient power in most other pursuits; while we forget, that in agriculture, it is the Archimedean lever, which, though it does not *move* a world, tends to *fill* one with plenty, with moral health and human happiness. Can it excite surprise, that under these circumstances of gross neglect, agriculture should have become among us, in popular estimation, a clownish and ignoble employment?

In the absence of professional agricultural schools, could we not do much to enlighten and to raise the character of American husbandry, by making its principles a branch of study in our district schools? This knowledge would seldom come amiss, and it would often prove a ready help, under misfortune, to those who should fail in other business. What man is there, who may not expect, at some time of life, to profit directly, by a knowledge of these principles? Who does not hope to become the owner, or cultivator, of a garden or a farm? And what man, enjoying the blessing of health, would be at a loss for the means of an honest livelihood, whose mind had been early imbued with the philosophy of rural culture—and who would rather work than beg.

An early acquaintance with natural science, is calculated to beget a taste for rural life, and rural labors, as sources of pleasure, profit and honor; to stimulate to the improvement of the mind—to elevate and to purify it—to self-respect, to moral deportment. And it will tend to deter from the formation of bad habits, which steal upon the ignorant and the idle unawares, and which consign thousands of promising young men to poverty and disgrace, if not to premature graves. A knowledge of these principles, to a very useful extent, can be acquired with as much facility, in the school or upon the farm, as other branches of learning. Why, then, shall they not be taught? Why shall we withhold from our agricultural population, that knowledge which is so indispensable to their profit, to their independence, and to their correct bearing as freemen?—Why, while we boast of our superior privileges, keep in comparative ignorance of the principles of their business, that class of our citizens who are truly the conservators of our freedom? We know of but one objection—the want of teachers. A few years ago, civil

engineers were not to be found among us. The demand for them created a supply. We have demonstrated, that we have the materials for civil engineers, and that we can work them up. We have materials for teachers of agricultural science, which we can also work up. Demand will always insure a supply.

The Conversion of Manure into Crops.

The great business of the farmer, who aims at profit, should be, to convert *useless* into *useful* matter—*dead, putrid* organic matter, into grain, grass and roots—into meat, milk and wool—into farm profits—into the means of wealth and rational happiness. To facilitate this desirable process, we bespeak the careful attention of the reader to the two articles, inserted in this and our last numbers, entitled "Agricultural Chemistry," written by Henry Madden, and copied from the Edinburgh Quarterly Journal of Agriculture. The part published in September, relates to *organic matters*, the true food of plants, and the true sources of agricultural profit and wealth. The part published to-day, relates to the mechanical and chemical improvement of soils, by means of mineral productions, or other than organic matters. Taken together, they form an excellent treatise and guide for the profitable management of the farm. And we beg of the unlearned reader, who may be disposed to throw them aside, unread, on the plea that they smack too much of science, carefully to preserve them, until himself, or his sons, shall wish, as they assuredly will, to consult them. Depend upon it, they contain much of deep interest, to him who would profit by the improvements of the age, as regards the profits and pleasures of agricultural pursuits.

And yet we cannot endorse all of Mr. Madden's principles, without some explanatory remarks. He urges a partial fermentation of vegeto-animal manures, or in other words, of stable and yard dung, before it is buried in the soil, on the ground, that crops stand in immediate need of its fertilizing powers, which can only be developed after fermentation has commenced; and we infer, that his remarks apply to small grain crops.—Scotland, for the benefit of whose husbandry Mr. Madden writes, is in a high latitude, the average heat of summer there being probably from five to ten degrees less than with us, and where the Indian corn crop, one of our great staples, is never attempted to be raised.—The decomposition, or fermentation of manure, is therefore more tardy there, when buried in the soil, than it is with us, and may not, consequently, take place in time to meet the wants of the early sown small grains. But with us the case is different. We have a hotter summer, to bring on earlier and more thorough fermentation in the soil. Besides, our unfermented manure is, or ought to be, principally applied to a crop which Scotland cannot grow—to our Indian corn, which needs its greatest stimulus after the small grain has been harvested. Unfermented manure applied to the corn and potato crops, to which it ought mainly to be applied with us, if spread broadcast and buried superficially in the soil, will decompose in time for the wants of these crops, if the soil is, as it should be, in a healthful condition, and will continue to afford them food, at a time most needed, when they are maturing their grain and their tubers in autumn, better than manure which has previously undergone the process of fermentation. When unfermented manure is deposited in the hill, a practice which we deprecate, these advantages may not result to the corn and potato crops. The manure, from lack of moisture, may not ferment, and of course will remain inert, if it is not prejudicial. We consider the corn and potato crops admirably calculated, in this way, to secure to us all the virtues of manure, without any preliminary process of fermenting it in the yard.

Seedling Plums.

There is no part of the Union, we believe, where so many fine seedling plums have been produced, as in Albany and its neighborhood. Plums have ever been a favorite fruit here, and the climate and soil seem well adapted to bring them to a fine state of perfection, and there has for many years been amateurs who have cultivated the best kinds with care. Where none but good kinds are cultivated, seedlings coming from them can scarcely be otherwise than good, proceeding as they must, from none but good parents. Among those who have thus produced esteemed varieties, to begin with olden time, we may name Mrs. Bleecker, Peter Yates, Chancellor Lansing, Isaac Dennison, Col. Young of Saratoga, Mr. Judson of Rensselaer, and some gentlemen in Schenectady. Many of these fruits bear the names of those who first introduced them into notice. There are probably fifty fine varieties which have been thus originated, superior to many named in the nursery catalogues, many of them remaining without any distinctive name. We tasted of nearly twenty new kinds last year, in Mr. Dennison's garden, all of high flavor; and we have just received a box of samples of seedling fruits from Col. Young, also of superior quality. We have also a seedling in our grounds which we esteem as highly as any we grow. As the season is now too late to do it, we throw out the suggestion, that the growers of new kinds, in this city and neighboring towns, meet together at a suitable time next year, with samples, to give them names, and to decide on their relative merits.

Frost.—In some of the northern districts, a severe frost was experienced early in September. Where corn is yet standing, we advise that it be immediately cut up and put in stook. We *know* this mode of harvesting will save the grain, and increase the fodder.

An Official Opinion.

"A post-master may enclose money in a letter to a publisher of a newspaper, to pay the subscription of a third person, and frank the letter, if written by himself."—AMOS KENDALL.—*American Farmer.*

Many post-masters have been scrupulous of enclosing moneys to printers of newspapers, from third persons, under an honest impression, that they would contravene the spirit of the post-office law. These doubts will now be dissipated by the above decision of the Post-master General.

The legitimate object of the post-office department, is not to accumulate revenue, but to accommodate the public, by as cheap and expeditious transmission of letters, newspapers and pamphlets, as the receipts of the department will allow. The construction here given by the Post-master General, will rather increase than diminish the revenue, because it will multiply the newspapers transmitted by mail. A post-master who desires, or is willing, to promote the diffusion of useful knowledge, may receive from a dozen or more of his agricultural neighbors, their subscription moneys for an agricultural journal, and transmit it free of charge to the publisher. The individuals will be benefitted, and the community will be benefitted, by the spread of useful knowledge, and the post-master will have the satisfaction of reflecting, that he has been instrumental in bringing about this good. Whereas, were each of his neighbors obliged to pay double postage on his letter and enclosure to the printer, often 50 cents, he might be deterred from becoming a subscriber, and himself and the public would lose the benefit of the improvements which the paper might induce.

Agriculture among the Romans.

Agriculture, among the Romans, was the *great* business. The first men studied its principles, directed its operations, and wrote treatises for the instruction of the unlearned. Some of the writings of Cato, Varro, Virgil, Columella, Pliny and Palladius have reached the present age. They show a familiar acquaintance with all the details of farming. The wealthy citizens, who spent their winters in the city, and their summers at their villas in the country, personally superintended every department of their business "Though the operations of agriculture," says the author of ancient husbandry, "were generally performed by servants, yet the great men among the Romans continued to give particular attention to it, studied its improvement, and were very careful and exact, in the management of all their country affairs." "After the landlord," says Cato, "has come to the villa, and performed his devotions, he ought that very day, if possible, to go through his farm; if not that day, at least the next. When he has considered in what manner his fields should be cultivated, what work should be done, and what not; next day he ought to call the bailiff, and inquire what of the work is done, and what remains; whether the laboring is far enough advanced for the season, and whether the things that remain might have been finished, and what is done about the wine, corn and all other things. When he has made himself acquainted with all of these, he ought to take an account of the workmen and working days. On holidays, old ditches may have been scoured, a highway repaired, briers cut, the garden digged, the meadows cleaned from weeds, twigs bound up, thorns pulled, far (bread-corn, maize,) pounded, all things made clean. When he is fully satisfied in all these things, and has given orders for the work that is to be finished, he should inspect the bailiff's accounts; his accounts of money, corn, fodder, wine and oil; what has been sold, what exacted, what remains, what of this has been sold, whether there is good security for what is owing. He should inspect the things that remain, buy what is wanting for the year, and let out what is necessary to be employed in this manner. He should give orders concerning the works he would have executed, and leave his orders in writing. He should inspect his flocks, make a sale, sell the superfluous wine, oil and corn; if they are giving a proper price, sell the old oxen, the refuse of the cattle and sheep, wool, hides, the old carts, old iron tools, &c. Whatever is superfluous he ought to sell. A farmer should be a seller, not a buyer."

And Columella directs the proprietor, on returning to his farm in the spring, "to view his marches, inspect every part of his farm, and observe whether in his absence any part of discipline or watchfulness has been dispensed with; and whether any vine, any tree, or any fruits are missing. Then, likewise, he ought to review the cattle and servants, all the instruments of husbandry and household furniture. If he continues to do all these things for some years, he will find a habit of discipline established when he is old; and at no age will he be so much impaired with years, as to be despised by his servants."

These directions are valuable, even in our day, to landed proprietors, particularly in the south, whose farms or plantations are managed by overseers or agents. There is great truth in the saying of Poor Richard, that a man who would thrive by the plough, must himself either hold or drive.

Northeast Storms.

Franklin, we believe, was the first to notice publicly, that northeast storms began at the southwest. During the last four days of August, the clouds portended rain with us, and the winds and temperature indicated a northeast storm upon the Atlantic coast. Yet we had not a drop of rain, and September brought us a clear sky and milder weather. It appears from the Norfolk papers, that a northeast storm commenced there on Wednesday the 28th, that the gale was severe, and much rain fell; and that the storm continued to rage with much violence during Thursday and Thursday night. On Friday the gale reached Boston. The wind blew with great violence, and the rain fell in great abundance. On Saturday it passed the barrier of the Green Mountains, in the form of a moderate rain, and continued in Dutchess, Orange, &c. from midday to midnight. The storm was probably felt earlier at the southwest, and later at the northeast.

Morus Multicaulis.

To keep our readers advised of the price current of this staple commodity, we state, on newspaper authority, that extensive sales have been made in Virginia, at 1½ and 2 cents the bud; that in the vicinity of Hartford, most of the plants have been bought up at 30 and 35 cents the plant; and that on Long-Island, prices have gone up to fifty cents a tree. A *tree* is supposed to be the growth of a bud planted last spring. Those who have to sell, we advise to take the above prices, if they can find buyers; but those who wish to buy will suffer no loss, we apprehend, in delaying to purchase at the above prices. Ten cents is a profitable return for each bud planted.

Effect of Slaking Lime.

"The *weight* of lime is increased from *thirty* to *fifty per cent* by slaking; and its *bulk* is *tripled* or *quadrupled*."—*See Prof. Jackson's remarks on limestone.*

These are important facts to the lime burner and lime buyer. To the burner, as it shows that the expense of transporting his lime to market, is a quarter less, in its fresh burnt state, than it is when the lime is slaked.—Nor should it be forgotten, that a ton of fresh burnt lime will acquire in five or six days, by exposure to the atmosphere alone, an additional weight of four or five hundred pounds. To the buyer, these facts teach the importance of buying fresh burnt lime. If he buys by weight, according to the Albany standard, lime long exposed to atmospheric influence, or imperfectly burnt, he pays for a quarter more than he gets. If he buys slaked lime by measure, he gets in the bushel only one-half, or one-third, what the bushel would give him in the fresh burnt-stone.

THE BUDGET.

Locust Hedges.—"I would like to know how honey locust hedges answer, when they become old, or if there is any thing better for hedges?—*Horace Wells.*" We have never seen an *old* honey locust hedge; yet judging from the appearance of our own, eight years old, we should think they will answer well, provided they are properly grown, and are kept properly clipped. Mr. Wells will find our opinion as to the best material for hedges, and of the mode of growing them, at pages 126, 176 and 192, of volume iv. of the Cultivator.

Peat Earth.—C. B. Clark has addressed to us several queries in regard to the value of peat as a manure, which it is wholly out of our power to answer satisfactorily, without knowing the quality of the material, the distance to which it is to be transported, and nature of the soil which it is to benefit. Peat is generally vegetable matter, which, on being brought into a state of decomposition by contact with fermenting materials, affords the proper food for farm crops—enriches lands. It may be worth much to those who have it at hand, and it may not pay expense to those who have to transport it a distance. These are matters of calculation which every farmer must make for himself, and for which no general rules can be prescribed. If we wish to fatten animals for the butcher, it is prudent to know beforehand, what the fattening materials will cost us, and what they will be worth to us—whether we are likely to lose or gain by the process. If there is no prospect of gain, we will sell the lean animal to him who has greater facilities for fattening. As with our animals, so it is with our crops. Manures constitute their food. Like animals, they should have good attendance; and if by an outlay of $5 in manure, we can add $10 to the value of their product, we realize a nett profit of $5. If we can apply this to a farm of 100 acres, it results, that an expenditure of $500 for manure will give a nett profit of $500—a result not at all uncommon, and very often below the actual gain. We can merely say to Mr. Clark, that every animal and vegetable substance is convertible into the food of plants; that it costs no more to cultivate a rich acre, than it does a poor one, and that hence, as a general rule, it is best to be liberal in our expenditures to make our land rich, that they may be productive and profitable.

Hog-Pen.—We have received from Long-Island a diagram of a hog-pen, which we doubt not is useful; but with all ingenuousness we are obliged to acknowledge, that we do not understand it; and believing that our readers will not, we must forego the expense of a cut till it is put into a more intelligible form.

Plans of Houses.—We received from Mr. Jewett and from Mr. Smealle, each two plans of houses. They were all placed in the hands of the gentlemen selected to award the premium. But in arranging them for publication, some mistakes have been made, and we don't know but we have given the diagrams of what each considered the least perfect. But verily we are unable, at present, to put the matter right.

Planting Trees.—"Being about to set out trees for ornament around my dwelling, I would be obliged to

you to say, through the Cultivator, whether it will answer, in our region, to set them out in the fall of the year, and at what time in the fall would be best?—*A Franklin County Subscriber.*

Answer.—*Deciduous* trees, that is, trees which shed their leaves in autumn, may be transplanted with safety, when they are not in a growing state, that is, at any time after the functions of the leaves have been arrested by frost in autumn, and before they come into leaf in the spring. If planted in autumn, in a high northern latitude, it is well to throw around the tree a shovel full of dung, or stable litter, to protect the roots from the cold of winter, and this may be withdrawn in May. *Evergreens* are best transplanted when they are growing, say from the 20th May to the 20th September—and we think the earlier in this time the better. Litter may also be thrown about these with advantage, not as a guard against frost, but to prevent evaporation.

Shovel Plough.—Solomon Rathbun, of Verona, Oneida, asks where he can obtain them, adapted to a two-horse team? As we cannot inform him, will some reader, who has them for sale, answer Mr. R's question, by writing him?

Disease in Calves.—Richard Shaw, of Berlin, Rensselaer, writes us, that his calves, 24 in number, about a fortnight since, were seized with a cough, of which several have died, and the rest, as well as a large stock of cattle, he is apprehensive of losing.

Grape Culture.—A Litchfield subscriber asks sundry questions in regard to the culture of the Isabella grape. He will find most of the information he desires in Mr. Tomlinson's communication in to-day's paper, and in Mr. Spooner's, vol. v. p. 61. The Isabella likes a rich and a moist soil. The cuttings are best made in autumn, and may be kept in the cellar, or buried in the soil.

Tomatoes.—In answer to the same correspondent, who asks how the tomato should be managed, and whether it will bear engrafting on the potato, we state, in the first place, that nothing, not even water or other liquid, is required to *cook* this vegetable. It is merely peeled, whan ripe, of its outer coat, and placed in a sauce pan over the fire, where it will cook. As to *seasoning*, tastes vary. Some put in merely salt, some salt and pepper, some add to these a little raw onion, and this is the way we like them—some add sugar, crum of bread, &c. In the second place, the tomato probably might be grafted on the potato, they belonging to the genus *solanum*. Our correspondent can easily make the experiment; but we confess we do not perceive that any benefit will accrue if he succeeds. We suspect the grafting of annuals will be found rather *curious* than *useful*.

Acknowledgements.

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CORRESPONDENCE.

A National Agricultural Society—A National Agricultural Convention proposed.

ESPECIALLY ADDRESSED TO THE EDITORS OF AGRICULTURAL JOURNALS, AND TO AGRICULTURAL SOCIETIES.

Essex County, Va. August 29, 1839.

DEAR SIR—Only a few days before I received your paper of the 15th of this month, I had read an account, in one of our political journals, of the last meeting of the "English Agricultural Society," at which our distingushed countrymen Mr. Webster gave them a speech. This account elicited in me so ardent a desire for the establishment of a similar society in the United States, that I was on the point of addressing *you*, and through your paper, the editors of all our other agricultural journals, a most earnest request to unite heart and hand in an effort to bring it about. But, to my great gratification, I find, by the last Cultivator, that you have anticipated me, by suggesting the project in your brief remarks upon the meeting of the English society. Do, my good sir, urge it again and again, upon all your subscribers, as well as upon your brother editors. It can hardly be possible, I think, that so agricultural a people as we are, should have so little of the spirit which should actuate us all, as not to be effectually roused into action when properly addressed; and who so fit to apply the necessary stimuli, as the editors of papers devoted to this great national cause?

Can we, the people of the United States, who boast of being more enlightened than any other civilized nation, in regard to all those principles and arts of government which are best calculated to promote and preserve human happiness—can *we* be so immeasurably behind them all, in applying these principles, and cultivating these arts, as not yet to perceive, that legislative aid to agriculture, in a country like ours, is a vital element in our national prosperity? It is, in fact, to the Body Politic, what the heart's blood is to the Body Natural: neither can exist in health and vigor, without its appropriate aliment.

What are the obstacles—the rational objections to aiding this vital art by legislation? Shall we be told by some of our martinet politicians, that our Federal Constitution forbids? Would to heaven they had been as lynx-eyed in guarding it against *other* attempts to infringe it—if indeed, the establishment of a National Society of Agriculture would thus operate! That the nation would have been richer by millions than it now is, could we have had such an institution, can not, I think, be doubted for a moment by any who are at all aware of the vast benefits which have resulted both to England and France, from the encouragement given by each to husbandry in all its branches; and I have yet to learn any good reason why we should not follow their example.

But thanks be to our good constitution, it has a provision in it which is perfectly intelligible, even to the most stupid; and none can dispute about the powers which it confers. I mean that which relates to the mode of choosing our immediate representatives. *This is the king-cure-all* for every political evil, provided it be executed as it *may* and *should be*. For example, let the agricultural districts—of which there is a vast majority in the United States—choose none but honest, intelligent and zealous agricultural men, or staunch friends to the cause, to represent them, and they might rely, with absolute certainty, that this cause would no longer suffer from the want of any aid that could be legitimately bestowed on it. Such members of congress would very soon find out a way to form a National Agricultural Society, that would speedily become one of the most popular associations in our whole country; and would prove in a few, a very few years, the means of extending to the utmost extremities of our Union, such a mass of information in regard to all the various branches of husbandry, as could not fail to render our nation the richest, as it is still, I believe, the happiest on the face of the earth. Our commerce and manufactures, which, next to agriculture, are the great sources of national wealth and power, would soon be abundantly supplied with all the materials essential to their prosperity; and nothing would be wanting to consummate our happiness, but the moral and religious education of our whole people.

Can there possibly be a single individual within the limits of our vast confederacy, who doubts this, even for a moment? *If there is*, I can only pray heartily, that he may speedily see the error of his ways, and most cordially co-operate in the attempt to establish a National Agricultural Society, with all of our fraternity who have full faith in that admirable proverb, (applicable, by the way, to all imaginable associations,) which tells us—"*United we stand—divided we fall.*"

One word more on this subject, and I will rely upon other and abler advocates to support it. Since it has become the fashion of late years to hold conventions for almost every purpose in which many persons are interested, I would respectfully propose, that one be held *in the City of Washington, on the second Monday of December next*, with a view of forming a National Agricultural Society; and that the different societies for the promotion of agriculture, throughout the United States, be invited to send deputies to it. Where no such associations exist, county meetings might be held of the friends of the cause, who might depute one of their own body, or the member of congress from their respective districts, to represent them in the convention. Should you approve this scheme, your paper might commence the invitations, and solicit your brother editors to repeat them. In this way, the proposal would speedily reach every state in the Union, and would first fall into the hands of the best friends to agriculture in each, for *they* alone deserve the title who support our agricultural papers.

Anxiously hoping that you will see this matter in the same light that I do, I remain, dear sir, your friend and constant reader. J. M. G.

Rust on the Potato.

Post-Office, Westmoreland, Oneida co. N. Y. Sept. 16, 1839.

DEAR SIR—As I am a farmer on a small scale, permit me to inquire of you, if the potato crop is often, or ever, in any section of country, cut short by its being struck with rust in a similar manner and about the same time that wheat is?

I have about two acres, and on digging a part of them, I find it takes thirty hills to get a bushel. This induced me to inquire of larger farmers in this town, the prospect of their potato crop. The universal expression is "very light crop." Among the many I have conversed with, one or two by observation, think it is owing to its being struck with rust; a new idea to me, perhaps it is familiar to you. How is it?

Yours obediently,
ABRAHAM HALLECK.

REMARKS.—We have heard of the *curl* destroying the potato crop, in Great-Britain, but have not before heard of its being injured by rust. The remark has, however, been made to us, that *this* year, the tops die prematurely, from what cause is not stated, and that the crop, where it has been taken up, proves unexpectedly to be a short one.—*Conductor.*

Propagation of the Grape.

HON. J. BUEL—Dear Sir—I sent you a dissertation on trees, and omitted to say something on grape vines, as I intended.

In transplanting grape vines with roots, I have found it difficult to save them. They have many very fine roots, and if they are not put up in wet moss, or some other wet preservative, they soon perish.

There is no difficulty in raising grape vines from good slips, much less than with roots. Cut the slips in autumn, after the leaves have fallen, and the vine has hibernated for the winter. Choose round and sound wood, well ripened and firm, (no flat wood,) the buds full and plump, the joints short between the buds.—(Suckers from the root of the vine, with long joints, are worthless.) Cut the upper end off within half an inch of the bud—put them in the ground sloping, the lower end deep, to have moisture. The upper bud should be covered half an inch under the ground, to break off the sun, and they are as easy raised as currant slips. I have set many slips with the upper bud above ground, as advised. They grew at first well, but the sun invariably killed them before the fall.

I planted some slips this season, and they have already grown from two to four feet. I have had bunches of grapes the third year on slips thus planted. If they are planted in sunny places, they should be watered the first year. Water is always acceptable to grape vines of any age. If not put out in the autumn, then cover the slips with wet ground or mulch, and set them in the spring. If put up in damp moss, or other matter, to prevent the slips from drying, they may be taken to Europe or elsewhere, till from November to May. Respectfully, D. TOMLINSON.

Remarks on Breeding.

Stockport, 9 *mo.* 10*th*, 1839.

ESTEEMED FRIEND, J. BUEL—"Walker on intermarriage," is the title of a work just republished in this country. Its object is to point out the rules to be observed in the selection of wives, with a view to the production of a beautiful, healthy and intellectual offspring. Although the primary object of the author is to ameliorate the form and intellect of the human species, by means of judicious intermarriages, yet he treats largely on the means of improving inferior animals, by means of breeding, and asserts that all his newly discovered laws, relative to the human species, are equally applicable to domestic animals. It is to the views which he takes of this latter subject, that I wish to call the attention of my agricultural brethren. Although I do not think he has *demonstrated* the laws, yet he has certainly brought forward a very respectable body of proof, for their support, sufficient at least to induce those who are interested in obtaining good animals, to give their serious and careful attention to his views.

It is necessary to observe, in order to render the sequel intelligible, that by the "locomotive system," we mean the organs of support, of motion, and of connexion, or bones, ligaments and muscles; and by the "vital system," we mean the organs of absorption, circulation, and secretion. The organs of absorption are sometimes denominated lacteals or lymphatics; their use is to absorb the nutritious portions of the food from the intestines, and to convey it to the heart, where it is mingled with the blood. The organs of circulation are the blood vessels, which circulate the blood from the heart to the extremities, and from the extremities back to the heart. The organs of secretion are the glands, where the various fluids of the body are secreted. The foundation of Walker's system of breeding is, that "like produces like." This has been stated before, but never satisfactorily shown to be the case, or in other words, while other authors have stated this to be the rule, they have at the same time stated such a numerous list of exceptions, that we are left in doubt whether it is any rule after all. These exceptions are shewn by Walker to be only apparent and not real.

The second law is extremely important if true, (and in order to ascertain whether it is so or not, nothing more is necessary than for one farmer in every county in the state, should observe it for two or three years, and send the result to the Cultivator office.) "Organization is propagated by halves," that is, one parent communicates to the offspring the fore part of the head, the long part of the face, the forms of the organs of sense, and the whole of the internal nutritive system. The resemblance to the parent who thus communicates "the vital system," will therefore be found in the forehead and long parts of the face, as the orbits, cheek bones, jaws, chin and teeth, as well as the shape of the organs of sense, and the tone of the voice. The other parent communicates the posterior part of the head, the bones, ligaments and muscles, or the whole of the fleshy parts. The resemblance to the parent who thus communicates the "locomotive system," must be found in the back head, the few more moveable parts of the face, as the external ear, under lip, lower part of the nose, eye-brows, and the external forms of the body, in so far as they depend on the muscles, as well as the form of the limbs, even to the fingers and toes, &c. If this law be correct, viz. that "organization is propagated in halves," or that one parent gives the *whole* of the "vital or nutritive system," and the other the whole of the "locomotive system," it will be perceived that many of our commonly received opinions and practices are erroneous. In crossing, we are commonly directed in the selection of a male to choose one most perfect in the points where the female is most deficient. But from this law, we learn that we shall not in all cases, accomplish our object. If a part of the "vital system" in the female is deficient, and we seek to improve the progeny by crossing with a male, perfect in these particulars, yet defective in some other portion of vital system, we shall fail, because one parent must necessarily communicate the *whole* of the vital system, as the other must necessarily communicate the *whole* locomotive system.

But I shall tresspass too much on the columns of the Cultivator, by tracing out the practical inferences. I shall therefore confine myself to a bare statement of the laws themselves. If we inquire how we are to as-

certain in what cases the male will give the locomotive system, and in what cases he will give the vital system, we are told by Walker, that where both parents are of the *same variety*, it is impossible to predict which series of organs will be communicated by the male, as between a bull and cow, both of the Short-Horns, or both of the Herefords. But in cases where the parents are of different breeds, as a Berkshire sow and China boar, both parents being of equal age and vigor, the male gives the back head with the locomotive organs, and the female the face and nutritive or vital organs. In individuals of the same *family*, that is, in breeding in and in, as between mother and son, or brother and sister, precisely the reverse takes place, the male then gives the face and vital organs, and the female the back head with the locomotive organs.

I have thus briefly stated some of the more important laws of breeding, discovered by Walker. Of course, in the narrow limits of a communication, it is impossible either to give the facts from which the laws were deduced, or the important practical consequences resulting from them. These latter, however, will readily suggest themselves to intelligent breeders. What I have written is offered with a view to guide them in observing the laws of procreation and, in the hope that if these laws are found to correspond with their experience, they may be induced to communicate their observations for the columns of the Cultivator.

N. N. D.

5,512 Product from one Seed.

Wheatland, Aug. 29, 1839.

Mr. J. Buel—Sir—I wish to inform you and the public, through your paper, the Cultivator, the great amount of wheat grown from one kernel of the common bearded wheat, grown in this town, which is 106 stalks, averaging 52 kernels to a stalk, amounting to 5,512 kernels.—

ALLEN SAGE.

Plans of Farm Buildings.

Jesse Buel—Respected Friend—On looking over the Cultivator of August 15th, I saw a number of well arranged and convenient plans of Dwelling Houses, which reminded me of one I drew and had published in the Farmer and Gardener, in the year 1835, accompanied by a plan of a barn also; I herewith send the wood cuts of both: if found worthy of a place in thy paper, thee may publish them. Having lately built nearly such a dwelling on my nursery farm, except one wing, which is omitted for the present, which on a year's trial, I find to make a very comfortable summer and winter house, by opening or shutting the folding doors between the two parlors. My spring being near the east end of the wing, and the ground falling in that direction, admitted of a wash-house under the kitchen, with its out door on a level with the ground. In this I have a large bake oven and boiler. This house is built in a neat, permanent manner, of stone, hewed granite to the water table in front and imitation granite above, with granite sills and portico floor, marble chimney pieces, pilaster casings, 8-4 doors and slate roof; cost here, where most stone are high, $4,101, exclusive of gates, gravel walks and ornamental planting, &c. I also built a barn some years ago, on this plan, except corn cribs, which were omitted, of stone. Cost $1,200, exclusive of gathering stone on the farm and hauling them, sand and lumber, with the farm hands. Respectfully,

ROBERT SINCLAIR, Sen.
Clairmont Nursery, near Baltimore, Md.

To the Patrons of the Cultivator.

Having in early life learned drawing and architecture, and being for several years engaged in the construction of buildings, I have derived great advantages, subsequently, from the information thus acquired, in the erection of even the roughest building on my farm, enabling me as it did in its plan and arrangement, to consult economy and convenience, and to adapt it to the peculiar purposes for which it was required, with the least possible expense, matters which, with a judicious agriculturist, should never be lost sight of. Indeed, according to my views, these are the chief objects to be consulted in the whole internal economy and management of a landed estate, whether regard be had to its cultivation, or to the improvements thereon. In saying this in favor of what may be considered the *useful*, I wish it not to be thought that I would reject, or that I am not a lover of, appropriate architectural decorations and ornaments; for of these I am a warm and decided admirer, and especially so where the means are ample, and can be spared from such things as are essential to comfort.

The approach to this building is intended to be either from the east, west, or north, and to terminate at the north door; to be protected from the northern blast by tall oak, hickory, or such other trees as may be native there, thinly scattered over the ground, which may be set in grass; and these to be interspersed with groups of *balsam fir*, or other evergreens, tastefully arranged for effect. Should such protection not be practicable, a well cultivated orchard of fruit trees will answer in their stead; but the latter, as well as a good vegetable garden, would, probably, except in the case described, answer best, if placed eastwardly of the mansion, and the farm buildings, such as barn, stabling, &c. to the westward, or reversed as might be required by the site, leaving the south front an *open lawn*, unincumbered with trees, except here and there, at a distance, single ornamental trees, with a few clumps of evergreens, and on the right and left small groves of ornamental trees and shrubs, so arranged as to make the lawn in front widen as these groves extend from the mansion.

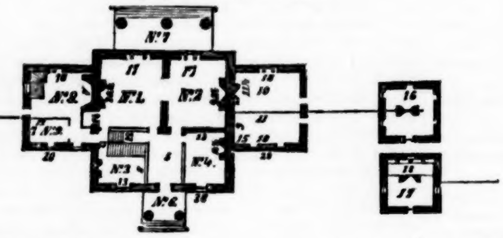
Explanations of the Drawings.—*Of the Mansion.*

A. Plan of the first story.

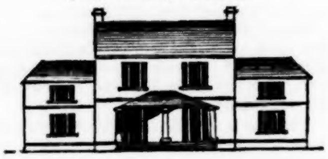
B. Elevation of the north front, with study and manager's house to the right and left.

[Fig. No. 37.]—Plan B.

[Fig. No. 36.]—Plan A.



[Nig. No. 38.]—Plan C.



C. The south front.

No. 1, common parlor: No. 2, drawing room: No. 3, housekeeper's or dressing room: No. 4, breakfast room: No. 5, entrance hall: No. 6, north portico: No. 7, south portico: No. 8, kitchen: No. 9, pantry: No. 10 & 11, office and store room or working shop, &c.: No. 12, passage from hall to kitchen, under the upper flight of stair steps, (this might if necessary be converted into a pantry or closet for china:) No. 13, passage from common parlor to dressing room.

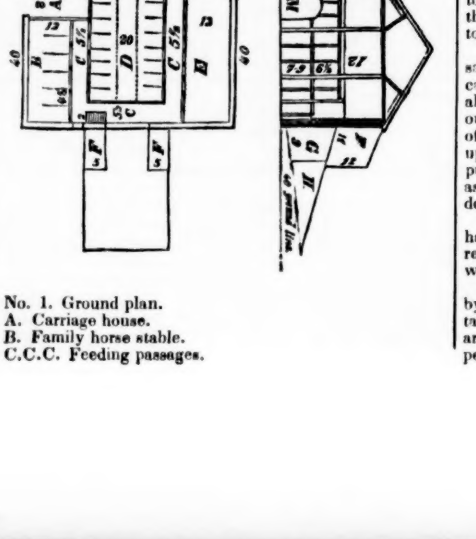
The second story to be divided as below with the addition of one room over the hall. The *garret* will make four good rooms, by having two windows in each gable end, and two dormant windows on each front.

By the arrangement of the rooms on the first floor it will be perceived, that, from the common parlor, with three steps the mistress of the family can be at the cellar door, which is situated under the first flight of stairs, or at the dressing room door, as occasion may require, and that with five steps she can reach the kitchen fire, a most important place, by the bye, for her to keep a vigilant eye over, if she be desirous of having her culinary affairs judiciously managed or her cooking well and economically done.

It will be observed that the kitchen fire place is in the rear of, and immediately adjoining, the back of the common parlor fire place. With some, this location of the kitchen fire place may be viewed as an objection, and as rendering the appearance of the building not as attractive as it would be if the chimney were at the extreme outer end of the kitchen, and with such I am ready to join in opinion. But if they only desire to relieve the general aspect of the building from what might be viewed in the light of an architectural deformity, their object can be attained by a very simple process, and one too, of but inconsiderable expense—by merely carrying up chimneys from the study and servant's rooms. Should this latter suggestion not be adopted, it will readily be conceded that the apparent defect in the beauty of the house is more than balanced by the superior utility, and increased comfort arising from the location of the kitchen fire place, as before premised. If the flue or funnel of the kitchen fire place be carried up in the same stack of chimneys, as those of the mansion house, being of the same height, it will be less liable to smoke than if under the influence of the eddy which would be formed were it carried up independently of, and of less elevation than, those of the main building, as they necessarily must be, if projected from the outer end of the kitchen. There are two other advantages to be gained by building the fire place adjoining the parlor: first, it will contribute largely towards warming it, and secondly, it will be more convenient for the superintendence of the mistress of the family, and yet the sitting parlor may be rendered entirely private, when necessary, by closing the door.

Having thus explained the drawings of the mansion house and its appendages, I shall now proceed to describe the *necessary* farm buildings for such an estate, and particularly if a large quantity of hay be raised and much stock be kept.

[Fig. ˇ o. 39.]



No. 1. Ground plan.
A. Carriage house.
B. Family horse stable.
C.C.C. Feeding passages.
D. Cow stables with door to back the cart in for the purpose of hauling out manure.
E. Stable for work horses.
F.F. Two lathed corn cribs.
G. A vacant space under the bridge leading into the barn, and between the barn and bridge abutment, which admits of a door into the granary between the stables and barn floor.
H. A walled embankment or bridge-way into the barn.
F.F. A covered enclosed way into the barn under which are two corn cribs, between which the cart passes into the barn.
M. A carriage-house door.
N. Barn door.
P.P. Hay mows.
R. A granary story divided into garners.
S. A door leading into the granary story.
T. A door to the feed passages.
U. A window with wide moveable slats to shut out cold, or let in air—several of these are necessary in the different stables.
V. Step ladder.

No. 1. A ground plan of a barn sixty feet by forty, showing the stalls and seats of the upright posts dividing and supporting the barn.

No. 2. A section of the gable end of the barn, showing all the timbers and scantling.

No. 3. The north section of the barn shewing the timbers and doors.

Inasmuch as the stone abutment of the bridgeway into the barn has to be built eight or nine feet from the back of the barn, to give entrance and air to the granary story, that part of the bridge has to be made of wood; hence the necessity of projecting the eve of the roof of the barn so as to protect the wood work from wet and consequent decay; and by boarding the outside and inside with a light frame of oaken lathe, one by three inches, two commodious corn cribs five by eleven or twelve feet will be formed, to throw corn into, in wet weather, as it may be husked in the barn. Under this bridgeway and these corn-cribs, there will be a convenient cart-shed, provided the barn be not built on too much of a declivity. From three to five feet is sufficient fall from the north end of the bridge-way to the south front of the barn, as the stabling is far more healthy when not much under ground. The earth may be removed from the foundation to the outer part of the bridge-way, so that the cost of it will be trifling, except for the wall around it to keep up the earth. By means of this bridge and covered-way, we not only gain a cart shed and two corn-cribs, but are enabled by it to get the carts, when loaded with either grain or hay, up into the barn floor, sixteen feet above the floor above the stables, thus affording the facility of conveying the hay and straw, by means of a funnel, to be prepared for the purpose, into the feed passages and granary below. The hay mows being seventeen by thirty-seven feet, and nineteen feet high, will hold a very large quantity, and besides a great deal may be stowed away above the square in the roof, there being no collar beams to take up the room. About one-half of these immense stowing rooms being below the caving rail, which is three and a half feet above the barn floor, the hay may be rolled off the cart into the mows, thus saving all the trouble and labor of pitching it up into the loft, as is the case in such stables and barns as have their floors on a level with the ground.

On the south front a cow-yard ought to be enclosed about one hundred and ten feet long, and from sixty to one hundred feet wide, according to the number of young cattle to be wintered in it. The milch and working cattle being fed in the stalls renders it unnecessary for it to be large. In this yard there ought to be either a fountain or pump to supply the stock with water. And it will be necessary for the horses to have a separate trough and apartment in the yard, and there should also be a shed along the east end for the cattle to go under in stormy weather.

It will be seen, that in this barn, all the provender necessary for the winter's supply, whether of hay, straw, or grain, can be stowed away; and that, from its great conveniences, all the stock may be fed during that period of the year, without those having charge of them being necessitated to go out of doors; and should the precaution be observed, of hanging up the gears of each horse, on hooks to be provided for that purpose, behind them, which should never be omitted; such as may be wanted may be harnessed without a moment's delay.

An implement-shed should, in addition to the buildings I have described, be erected near the stable, which beside its real utility in the preservation of tools and implements, always reflects credit upon the proprietor of an estate.

I think it will strike the intelligent farmer and planter, that by thus concentrating the out-buildings on an extensive plantation, convenience, economy and comfort, to man and beast, are all eminently consulted, and that in point of beauty in appearance, it very far surpasses the old *plan* if it may be so

termed, of having a barn here, a stable there, corn-house in one place, and a cow-house in another—this latter arrangement always had in my view a most unsightly and un-system-like aspect.

If a thrashing machine should be intended to be used in the getting out of the grain, preparation for the horse-path may be made under barn floor, in the cow stables, or in a part of one of the passages, from which a strap may pass upwards to a wheel on the machine.

ROBERT SINCLAIR.

Importance of selecting Seed.

Liberty, Bedford Co. Va. August 22, 1839.

To Judge Buel, Editor of "The Cultivator."

Sir—It has been said that he who enables us to rear two blades of grass where formerly we raised but one, is a benefactor to mankind. He then who teaches his fellow men to rear two ears of corn where formerly they raised but one, is no less a benefactor of his species. Several gentlemen in our country apparently claim paternity of the idea of selecting seed corn from the most prolific stalks. And many purchase at high prices small parcels of seed corn thus selected, called after a Mr. Baden, whose name it has assumed from his distributing it, and from its singular yield, &c. It matters not to the cultivator who rears it, what name it bears, or who first conceived the idea, so he is benefited by it. Nor should its true parent care, so he can enjoy the high gratification of having promoted the interest of his fellow men. The idea was first suggested to me in the year of 1800, when a small boy, occasionally attending to my father's stock of animals, from the peculiar fruitfulness of a single one of them and all her progeny of both sexes, which I particularly noticed for several years; and in 1815, when I became a cultivator of the soil, my first object was good seed of every crop I wished to raise. And recollecting the success of my experiments in raising stock from the offspring of the above animal, I commenced the experiment on the vegetable creation, by selecting my seed corn (the most important crop in our country,) in the fall of 1815, exclusively from stalks having two good ears on them, cutting the stalks off at the ground, and hanging them in a high dry place secure from rats, &c. until planting season; then shelling off a little from the small end of each ear and planting the balance of the ear; and being fully satisfied of the increased product, disclosed it to my neighbors, all of whom, who saw my corn in the field, or who tried my seed with their own, were fully convinced of its beneficial results, and by degrees it has spread over the country generally. In the fall of 1821, as a means of diffusing the information as above acquired as extensively as I could, I wrote to Mr. Skinner, editor of that most invaluable periodical, "The American Farmer," of Baltimore, (and which paper I am pleased to hear Mr. Skinner has recommenced publishing in that city. Those having that paper of above date can refer to my letter.) Soon after which, I sent to several gentlemen, at their request, supplies of seed corn near Baltimore, Richmond, Charleston, &c. all of whom were fully satisfied on the first trial of its peculiar and uncommon product. Some years afterwards it was said by some that the crops from the seed collected as above was later, and of course more subject to injury from early frosts, &c. To obviate which, I selected my seed from the double, treble and quadruple ears that were most forward, and soonest matured and ripe. This was done without any sort of trouble, as follows: When my hands were cutting the tops off the corn in September, for winter forage, &c. I directed the tops to be left of those stalks *only* which had the most forward and fine of the double, treble and quadruple ears, which was perceptible to every eye by the dead silks, or by the shuck whitening and drying first, &c. By this mode at gathering time one may know at a distance all the selected seed corn; and by this process, in a few years, my corn was decidedly earlier and more forward than any of the same kind, the seed of which had not been selected from the most forward, as was acknowledged by all who planted of my seed thus selected. I would, therefore, respectfully suggest, through the medium of your very valuable and widely circulating paper, "The Cultivator," to all corn planters (as well as of vegetables generally) of any kind of corn they choose to cultivate, not to reject the idea because their ancestors have not pursued it from time immemorial; and after a few years' trial of it, (which can give them very little trouble) if they should find no benefit from it, to drop it. I have not for many years, owing to professional duties, increased afflictions, and other causes, attended to this subject as much as its importance deserved, although it has not been wholly neglected; and I can now show in my fields of Indian corn, of the same identical kind I commenced with in 1815, many stalks having three, four and five ears each; and some (including short corn) six, seven and eight ears each. A brother chip of mine, in an adjoining county, some years ago, purchased a small tract of land and planted my seed corn on it the first year, and assured me the following fall, that the astonishing product from that seed had enabled him the same summer to sell the land at an advance of over one hundred per cent profit. I might relate many other facts of some interest on this subject, but my purpose will be fully answered, if from what I have said, I may induce those who cultivate the soil to try this experiment themselves, as well with other vegetables as with Indian corn; for I doubt not a fair experiment would prove equally propitious and satisfactory with many of the vegetable creation if fully and fairly tried. Indeed, the selection of good *ripe*, well chosen seed of any and every kind, is well worthy the attention of every cultivator of the soil. I may, Mr. Editor, towards planting season, give you some account of my experience as to the manner of preparing seed corn when planting, &c. and its results, (as this letter is already long enough,) and I hope editors of agricultural papers and newspapers will give the above suggestions an insertion for the benefit of their patrons, &c. Your subscriber, and ob't serv't,

WM. COOK.

To prevent the Murrain in Cattle.

East Raisinville, Monroe Co. Mich. July 26, 1839.

J. Buel, Esq.—Dear Sir—In the July number of the Cultivator for this year, which came to hand two or three days since, I have read the communication from Mr. Payn of Black Locust Grove. I have never read any thing which more fully accorded to my views and experience on the subject of murrain in cattle. For the last thirty years I have resided in the north part of the state of Ohio and in the east of Michigan. I have suffered severely in the loss of stock by this grievous plague, until about eight years since, losing every year more or less, from one to sixteen head in a season. As for a specific cure, I do not believe there is any; but I will give you the result of my experience as to a preventive. If you think best to give it to the public through the columns of the Cultivator, you are at liberty to do so. About eight years since I had lost two fine oxen, and was then doctoring the third, which was in the last stage of the disease. An elderly gentleman was passing, and rendered me some assistance. He told me that there was no use in doctoring; the better way was to prevent. He gave me the following as a preventive, and added that it was so simple he doubted much whether I would follow it. He said, fix you a trough in the yard where your cattle could go to it every day, and mix equal portions of slaked lime and salt, and keep it always there. "And," he added, "if after three months, you lose a creature, draw an order on me and I will pay for for it." Since that time I have literally lived up to the specification, and I have never lost but one cow since, and I have kept from fifteen to fifty head on my farm ever since. Now, sir, whether it is the addition of lime, or whether it is the regularity of always having salt where they can take what they please, and not one day take a larger supply than is heathful, and then be without, I do not know, but there are some facts I do know, that the stock will not consume as much salt mixed with lime as they will without; and such is my confidence in the remedy, that when I change my cattle to fresh pasture, that my portable salt trough goes with them, and is always kept well supplied with the mixture. I said I had lost one cow: the circumstance was this: on examining into the matter, I found the man that had the care of my stock (for I was much away myself) had put the lime barrel down cellar, and the moisture of the cellar had entirely destroyed the properties of the lime. My method is to procure my lime and set it in a dry place, and let it air slack, and I am always supplied with the article as fast as I need it. With this instance excepted, I have never seen a healthier stock than mine, and I attribute it entirely to the lime and salt, as there is in this country, and my neighbors all around me are losing more or less every season. I am not able to give you the whys and the wherefores about the matter, nor am I competent to write for the Cultivator; and I have to say, that should it be published it will require some time and patience to make it as it should be; but the correctness of the facts I vouch for. Yours with great respect,

LEANDER SACKETT.

Rev. Mr. Lodor's Select School.

Montvue, Warren Co. Va. (P. O. Middletown, Fred. Co.) August 20th, 1839.

Honored Sir—In the Cultivator of the present month, (vol. VI. No. 6,) I observe an editorial notice of my private and select school. I certainly feel under obligations to you and your kind correspondent. The notice referred to, terms it *a manual labor school.* The labor, however, is altogether *agricultural* and *horticultural.* Formerly, a *mere manual labor* system was pursued, but the idea of an *agricultural* school was first obtained from the perusal of your truly valuable periodical, of which I have the pleasure to be a subscriber and constant reader. The plan of my school is, to enable youth to obtain literary and scientific, in connexion with agricultural knowledge, and at the same time to diminish the expenses of their education by their personal labor in the garden and on the farm. It is altogether a private establishment upon a small scale, no more being admitted to the agricultural department than may be deemed necessary to carry on a limited system of rural occupations. The course of education pursued in the literary department is a liberal one, yet the number of students likewise limited. In this department, I have the happiness to say, a number of young men have been educated, who stand high in the several professions of law, medicine and divinity. The agricultural department is as yet in its infancy, but as far as my experiments have extended, I see no ground for discouragement, although an entire novelty in this part of the country. I hope you will excuse the liberty I thus take of calling your attention to the error in terming it merely a *manual labor school;* an error of little importance in itself, were it not that it makes your periodical apparently depart from its legitimate objects in noticing that which has no immediate connexion with agriculture. The connecting of an agricultural department with my school, I do not consider of any pecuniary advantage to myself, the labor of inexperienced youth by no means compensating for the deduction required to be made in their session bills. Yet I cannot doubt the ultimate success and utility of these schools in a country like ours. And I hope you will persevere in your laudable efforts to press this subject upon the attention of the community. I have been much interested in reading your articles on this subject, both editoral and from correspondents. And may you reap the pleasure of beholding success following your every effort. The high encomiums passed upon your periodical by gentlemen of scientific and agricultural standing in every part of our nation, render any expressions on my part altogether superfluous. Suffice it to say, that it is considered by myself and friends here as decidedly the most useful and the most ably conducted agricultural publication within our knowledge. Very respectfully,

JOHN LODOR.

Common School Education.

Schenectady, 11*th September*, 1839.

Dear Sir,—In your last number of the Cultivator, for September, I saw a "Circular on Common School Education," over the signatures of the distinguished names of Theodore Frelinghuysen of New-Jersey, Charles Brooks of Massachusetts, Henry R. Schoolcraft of Michigan, Theodore Dwight, jr. of New-York.

It is a pleasing circumstance that such men have engaged in this important cause. I hope a new system of education will be established,—I mean a new set of books, written purposely, so that when children are learning to read, they may learn the principles of a moral life.

The best patrimony that children inherit, is a correct moral education. Hitherto children have been taught to read, with the single object of learning to read only, when they might have had the foundation of a moral life, if the books employed in teaching were so written as to inculcate those firm principles of moral ethics which are calculated to make us happy in this life, and the only mode of living so hereafter, by learning to love God with all the heart, and our neighbor as ourselves. If this divine principle was in full practice here, we should enjoy heaven on earth. And is it not chargeable to faulty education that it is not so?

Some persons assert, that the natural temper and faculties of man are the sole cause of their evil conduct in this life, and that it cannot be prevented by education. Such opinions must arise from want of observation. Why are the inhabitants of South Africa and Southern South America living in a degraded state, almost on a par with the brutes? And yet those men are made with rational faculties of improvement like all other men, where the greatest improvements have been made, by cultivating their natural faculties.

A friend of mine informed me, many years ago, that he knew a man of a family, living on the border of Oneida lake, in the state of New-York, at the time when that county was a wilderness. The son told my friend that they could not raise a pig without great care, as bears and other wild animals would take them for food. That they had a cow, which fed in the forest; that his mother went to look in the woods for her to milk her, and that if night overtook his mother before she found the cow, she made her bed, when the darkness stopped her search. This was a white woman, and it must be evident that her degraded state was chargeable to want of education. What a wide difference between that woman and a delicate and well educated woman, in civil society! And is not education the sole cause of difference?

Education does not always produce virtue, for education has not always been founded on virtuous principles. Even our accademic schools are faulty, in teaching the dead languages in books written by those who knew not christian principles, and exhibited the most glorious actions to be those which could accomplish the greatest destruction of their fellow men by skilful warfare. Even the teachers of morals are faulty. Paley has been the standard of moral ethics in our colleges, and Paley's maxims are almost void of christian moral ethics. They are mere worldly expedients. If such a course is pursued, when will our youth become moral and correct? Education makes the man and the christian. "Evil communications corrupt good manners." I pray that these distinguished men, when in convention in November, as proposed, will renovate the whole system. God bless their labors to that use.

While a convention of such men, and for such purpose, meet for the improvement of education, I would suggest the propriety of their giving attention to the correction of orthography. There is now a great waste of time and space in writing many words, according to the continuation of the old mode of spelling, such as spinning, beginning, running, &c. &c.

The verb of spin is changed to the participle of the present tense by adding *ing*, when ning is nonsense, as ning is a word of no meaning. So the verb to commit, is changed to the participle of the past tense, by adding *ed*, when the present mode is *ted*, which is nonsense. So the using two g's in the word drugist, bagage, wagon, &c. &c. I have, for a long time, made the correction, under the risk of being called a faulty speller.

It needs some authority to make the correction general. Lexicographers dare not, but such a convention would be justified, and receive public approbation and thanks.

Will you please to make this known to those gentlemen. It can't offend them. Respectfully,

DAVID TOMLINSON.

The Peach Tree Grub.

New-York, Sept. 17, 1839.

I desire to add my mite to the stock of information communicated by Mr. Lancaster in vol. 6, No. 8, of the Cultivator, at page 133, in relation to the grub worm.

There are two causes of decay in the peach tree:

First. Over bearing, by which the tree is exhausted, arising from the unwillingness we have generally to part with any of the fruit, and neglecting to furnish the proper food for the tree.

Second. The grub worm.

When I resided in New-Jersey, I took great care and spared no expense to have good peaches, and while I did that I had great abundance.

The course I pursued was, every spring and early in autumn to clear away the ground at the stem of the tree near the roots and near the surface of the ground, and put tobacco leaves round the body of the tree, then cover up the tobacco with the earth, the dampness of which round the tobacco caused an effluvia that no *worm* could penetrate the tobacco, or live in or near the root of the tree, if peradventure he had got in there. To prevent exhaustion I sent to the woods and procured the surface soil, which was decayed leaves, and is a valuable food for the tree.

This course I pursued several years, and while I did it I had every year a great abundance of the finest fruit, and as soon as I neglected it my trees failed and were destroyed by the grub. I have recently discovered what I think will be a complete protection against the grub, and a manure that will furnish food for the tree far better than any thing yet tried. I have not yet tried it to the peach tree, because now I have no peach trees. I have recommended others to try it, and hope to do it another year myself.

I would put around the roots of the peach tree, having first cleared away the earth from the roots, about 4 quarts of poudrette as manure, and draw the earth over the poudrette in the spring of the year. It has proved the most valuable manure for grape vines, morus multicaulis, and young apple trees, when they are first set out, of any other application whatsoever.—Next to, and around the body of the tree, and at the root, where the grub is sure to make his entry, I would *put two quarts of urate*, spring and autumn, and cover it over with the earth, and sprinkle it in a slight degree with water. *Urate* is similar to what hartshorn is sometimes made of, and when damp produces as strong an odor as the strongest hartshorn, and you may judge how long a human being could live inhaling at every breath the smell of hartshorn, and then you can easily imagine how long it is possible for a *worm* to live in it.

I have killed the grub by the application of boiling hot water, poured from a teakettle on the root and body of the tree where they were, and have seen the sickly leaves assume a healthy appearance for a time.

A. DEY.

Application of Salt to Trees—The Borer.

Whalen's Store, N. Y. Aug. 17, 1839.

J. Buel, Esq.—Dear Sir—A communication has been going the rounds in the papers, recommending the application of salt to the roots of fruit trees. I would say to those disposed to try it, do so cautiously; salt in large quantity will destroy all kinds of vegetation, even the Canada-thistle itself, and if the application be a liberal one, I will venture to say, it will kill every tree, root and branch, that it comes in contact with. Permit me here to state a single experiment I made three years since, to free the yellow-locust from the borer. I had some half a dozen trees in my door yard, about four inches in diameter, that were in a fair way of being soon destroyed by this pest. I cleaned out the holes from whence the dust issued, and pushed lightly into each with a stick, a small piece of camphor about the size of a large pea; from that day to this the borer has entirely ceased its operations on the trees thus served.

Respectfully yours, SETH WHALEN.

Physiology—Improved Husbandry—Agricultural College.

Hon. J. Buel—Dear Sir.—All vertebral animals circulate red blood, and all other animals below, and not vertebral, and all insects, have white blood. The blood of all animals is white at its formation, and from its passage from the absorbing vessels, which take up the nutriment and convey it through the lymphatic vessels to the blood in the large veins, from which it enters the right auricle of the heart, thence to the right ventricle, whence it is thrown by the heart into the lungs. There it is changed, with the dark colored venus blood, to the florid red color. It then is returned to the left auricle of the heart, thence to the left ventricle, whence it is thrown, with the power of a steam-engine, into the aorta which branch to the upper and lower region of the body, and the blood is circulated to every minute part of the body and skin, to nourish, invigorate and beautify the body. It then enters the capillary veins and is conveyed to the larger veins, till it reaches and passes the great vena porta through the liver, to the heart, to perform again the repeated circulation to nourish and sustain the body. Breathing air cannot be dispensed with for a few minutes only without the loss of life. The blood must be thus renovated and supplied with the principles of life, in the lungs, by the air, for new and constant nourishment of the body, or the heart will refuse to circulate it and sustain animal life, and the body must die.

Death is the absence of life. The moment the body ceases to live, the muscles become flaccid, and their full, round and beautiful appearance vanishes. The skin puts on her cadaverous habiliments, and decomposition of the body commences, and progresses rapidly if the weather be warm, and slower if cold. It is dissipated—earth to earth, dust to dust, water to water, air to air, &c. &c. So the various component parts of the body seek their native home in their homogenous elements. Many of them are taken up by the vegetable family, and become food for animals, forming new combinations, in vegetable and animal bodies, which die, and are again the sustenance of other vegetables and animals without limit.

It is astonishing that the pagan tradition of the resurrection of the *body of flesh*, is so strongly impressed on the mind in childhood, as to continue through life, when the common sense and truth of the fact is so plainly and forcibly illustrated by St. Paul to the Corintians, (I Corinthians, 15 chap.) in combating the same error in that day, of the resurrection of the *body of flesh.* The body is dissolved and scattered to the four winds of heaven: and if it were to rise again and live, it must be subject to a second death—to be burnt alive at the great and final conflagration—for flesh and blood cannot inherit the kingdom of heaven, says Paul. The red blood of all animals is alike, and if viewed through a magnifying glass, there appears little if any difference in it; and that apparent difference, probably, is more speculative than real.

All animals that breathe air in a volume, have hot blood. The heat of the blood is derived from the air, which is suddenly decomposed on entering the cells of the lungs, and the latent caloric in the air is let loose, and enters the blood with the oxygen. This may be in some measure illustrated by slaking fresh burnt lime. If water is poured on stone lime, just enough to slake the lime suddenly and no more, the water is so suddenly absorbed by the lime as to become solid with the lime, leaving the caloric free, so that it may kindle and ignite wood and other combustibles.

All animals that do not breath the air, have cold blood. I would not be understood to say, that there are any animals that do not breathe air; for all animals, and all vegetables, every thing possessing life, breathes air in limited portions. Even the oyster breathes air. It finds sufficient air in the water, where it is bred, feeds and lives. The film or fringe around the edge of the shell, is the lungs which inhale air from the water. If the oyster is shut up close, to exclude water and air, it will soon perish, as all animals must.

So the foliage of vegetables are the lungs, and if air be excluded from them, they must perish. They must have light also; for without light a long time, the leaves die and fall off, and the plant stops its growth. House plants kept in a dark room or celler in winter, prove this. But some vegetables, like some animals, suffer sooner than others when deprived of air. The potatoe vine will drown almost as soon as many animals or insects will, when covered with water. If it is covered with water but a few hours, it lingers and perishes.

Some aquatic plant find sufficient air in the water, where they grow, to sustain them, as fish do, and perish if placed in the air, as they cannot inhale air in a volume. The fish are observed to be constantly swallowing water, which passes out at the gills, which are the lungs, and they inhale air from the water sufficient to sustain life.

The large whale must breathe a volume of air, and must throw himself out of the water to breathe. Although he rolls head and tail out of water to breathe, which he does apparently in an easy and leisurely manner, yet, when he is seen to rise again, the distance he has made, shows that he moves with the velocity of the steam-boat, as I have noticed them in pairs, in the Atlantic ocean. Their tail is flat, or horizontal, like the porpoise and herring hog, all which rise above the water to breathe air. The whale sails with the ta l; and by bending it under water, and then extending the tail suddenly, can throw his huge body with great speed above the water to breathe.

The farmer may, if he will, by contemplating these natural properties and propensities of animals and vegetables, learn how to preserve both in health and growth. He may learn that good air is indispensable to all animals that live in the air. All animals of the farm stock are more healthy, and thrive better, if their places of feeding and sleeping are furnished with wholesome and fresh air. So the various plants cultivated on the farm require to be planted, some on the dry part of the farm, and others where the ground is more damp. Regular moisture suits potatoes. If their growth is suspended by drought for a while, and after the tubers are of some size and are again supplied by rain, they are apt to sprout again; certainly if the vines are dead; and when they do so, the potatoes are of inferior quality. Damp ground, where the water will not pond, is suitable.

The public are convinced that there has been a great defect in agricultural management; particularly in this state. Not many years past, the state of the harvest in Europe was anxiously inquired after, particularly England, whether there was a prospect of a market there for our surplus bread stuffs. It is now within the knowledge of all, and painfully by many, that, the population of the state of New-York has fed on European wheat, to the amount of many millions annually, for several years past; and that, too, when there was not a failure of the crops of wheat here. Pork and beef have also been scarce and prices high. These prove a faulty agricultural management.

Your Cultivator furnishes many statements of great crops—double and treble product on the acre, by scientific culture, above the ordinary and ignorant mode of farming.

It is notorious, that when the vegetable soil of the land in Dutchess county, in this state, had become exhausted by extensive culture, it was supposed that the land was of no value; and in some instances it was abandoned as not worth fencing for tillage. By scientific culture, in the use of plaster and manures, it has, for many years, been called the *garden* of the State; and is really the most productive and richest county in the State, and the same lands sell for one hundred dollars per acre by the farm. All this has been accomplished by scientific agriculture.

Will our legislature continue to confine all their aid of science, to academic seminaries alone? I approve their aid to literature, for the benefit of the liberal professions; but would ask them equally to foster the great agricultural interest, by establishing ONE AGRICULTURAL COLLEGE, that the sons of farmers, who desire to improve that profession, and raise it above the present state, called drudgery, may do so.

For several years past the farmers in this region have purchased their bread stuffs, and that too at double the former prices. If farming shall become a science, as it will, if properly encouraged by an agricultural college, the present impediments to the growing their own bread corn in all parts of this country will soon vanish, and we shall not again see an agricultural people importing their bread stuffs from a foreign country, when there is no calamitous loss of crops.

Every county and town in the state should address their petitions to the next legislature, asking them to establish an agricultural college, that the farmers may improve and feel the first of the profit and blessing of good husbandry, and all classes will participate, as successful agriculture is the foundation of all our prosperity. What a wide and interesting field do the animal and vegetable kingdoms offer to men of science in agriculture? It is inexhaustible in its pleasures and rewards, both to the mind and the purse. An agricultural college will render the profession of farming more scientific and more honorable, and induce a new class of men of wealth and genius to enter the agricultural field, and the riches and comfort of this country will soon approach nearer to happiness and content.

Let not the demon of party politics prevent the measure, for all parties must profit by improvement in farming. Most respectfully,

DAVID TOMLINSON.

Schenectady, September 5, 1839.

Hints on Building Farm Dwelling Houses—Oil Cake.

Mr. Cultivator—Sir—I am much pleased to notice the interest felt by yourself and some of your readers, on the subject of "Farm Dwelling Houses;" as evinced by the plans given in the last Cultivator. The subject is one of great importance in this country; and without attempting a criticism on the plans you have submitted, I will offer one or two suggestions, which you may receive for what they are worth.

1. Although cheapness and utility are the main requisites, in all plans for all country houses for the farmer in moderate circumstances, yet as the humblest tenement has a moral, as well as an utilitarian effect, both on the incumbent and the beholder, some degree of expression, or architectural effect, should also be aimed at by the builder. The architecture of the cottage and farmery should be peculiar to themselves; and of that picturesque character which will best harmonize with the scenery and occupations by which they are surrounded. For this purpose, small country houses, or cottages, should never be of more than one story, or one and a half in height. The roof might be made very steep so that at least two good square ceiled rooms might be had, together with three or four with inclined ceilings, on the second floor; leaving still an upper garret of dimensions sufficient for a drying room or lumber room. If a piazza and a lobby around the main door were added, (which no cottage should be without,) they would contribute equally to comfort and picturesque effect.

2. The house, instead of being placed on level ground, should always be upon a knoll; and where one does not present naturally, it may be formed by throwing the earth dug out of the cellar around the walls outside. This would not only save something in digging the cellar, which would not need to be so deep in the earth, but it would be drier, and better aired; at the same time that it would give dignity and effect to the general appearance of the building.

3. The chimneys should never, where it can be avoided, be placed in an outer wall. This is an important defect in most houses of this country. The consequence is, a very large quantity of heat generated by the fire, is lost. When they are all in the inner or partition walls, the heat of the back and sides of the fire-places, together with that of the whole chimney, produces a material difference in the temperature of the whole house. A still better plan would be to use Franklin stoves instead of fireplaces, in all rooms except the kitchen, and carry the pipe straight up through the ceiling into a drum in the room above and from thence into the chimney. This would save something in building; as the stoves would not cost quite as much as fire places, with mantels, &c. and greatly lessen the consumption of fuel. The fuel generally contained in a common fire place, is amply sufficient for heating two rooms in this way. This is,

in fact, the most economical mode of heating by fire *in* the room. The new mode of heating by a furnace *without* the room, or the hot water plan, is probably cheaper and better; but is not likely to be adopted very extensively in cottages or farm houses. Some I know would propose close stoves instead of Franklins; but they are detestable things, and cost you as as much in doctors' bills as they save in fuel.

3. When building, it would cost no more to dig the well in the kitchen or woodhouse adjoining, than at a distance, and would be far more convenient. The same may be said of the privy or water closet, which can be as well within as without the house, if properly constructed.

4. There is economy, as well as convenience, in combining all the offices of a farmery as much as possible under one roof. You will find much that would interest your readers on this point, in Loudon's Encyclopedia of cottage, farm and villa architecture, and in the works of several other English writers on cottage architecture that have lately appeared, and the work of a French architect, named Morel Vindé, if I recollect aright. I believe we are far behind the English in architecture in general; and the "snug English cottage and farmery," with alterations to adapt it to the taste and wants of our farmers, would be a great acquisition to our country.

I hope this subject will be pursued by you and your readers; and that we shall have a variety of plans from time to time in your "Cultivator," not only of farm dwellings, but of farmeries and farm out houses, in which picturesque and architectural effect will be combined with cheapness and utility. There is a gentleman in our state, who from the attention he has given to this subject, I presume to be well qualified to enlighten the rest of us. I know not whether he is one of your subscribers or not; if not, he ought to be; if he is—hoping this will meet his eye, I will venture to say to Mr. Lord, that the possession of talents which enables him to serve his countrymen in any way, implies the obligation to do so; and a *hint* to as sensible a man as he is, *ought* to be sufficient. Yours,

D***** F***.

P. S. I made some inquires of you nearly twelve months since, respecting the use of oil cake or flax seed meal, as feed for cattle. Since that time, I have had an opportunity of trying it for myself—having fed eight cows upon it—and I can safely recommend it to such of your readers who are as ignorant of it as I then was, as a most invaluable feed. My cows gave considerably more and better milk than before. Indeed I found it of sufficient advantage to them to pay for giving them a meal of it morning and evening all through the summer, although my pasture has been good and abundant. For fattening calves it is excellent. A little of it mixed with the cow's milk, will do better than to let them run with the cow altogether, at the same time that you save the greater part of the milk.

One of my neighbors has also used it for raising sheep, and another for fattening hogs; and both speak of it in equally favorable terms. Hogs fatten very rapidly on it; and if put upon corn wholly for a short time before killing them, their flesh is said to be as good as if always fed on corn.

Objection to Zinc Roofs—Soaking Seed Corn—Chinese Corn.

Rose-Hill, Flushing, Aug. 21, 1839.

J. Buel, Esq.—Dear Sir—In the "Cultivator" for this month, I notice a communication from Egbert Hawley, relative to the construction of farm houses. Of roofs he says—"shingles are becoming scarce, and inferior in quality, and we must look for a substitute. Slate are expensive, liable to break, and I *suppose* not quite tight, &c. and in casting about for a good covering, *sheets of zinc* have appeared to me to be a desirable article. It has one good quality, at least; it will not rust like tin. Cannot some of your correspondents tell us where it has been tried, and how well it answers? Such knowledge would be very desirable to future builders."

I can inform Mr. Hawley, that "sheets of zinc" were tried upon several of the large buildings in the U. S. Navy Yard at Pensacola, and found *not to answer at all as roofing*. They would leak, although put on with the greatest care, and not a nail would hold where originally driven. The difficulty is, that the metal will *expand* and *contract* on every change of temperature, and to such an extent as to defy all attempts to prevent it. It was found necessary to remove the zinc, and substitute *slate*, which, *when properly put on*, I conceive to be the best article for roof, *quality* and *size* being duly considered.

If metal is desirable in any case, I should select *tin*, of suitable size and thickness, have it well soldered, and then painted. According to my experience, the only objection to tin is, not that it rusts, but, that after a time, however smoothly it may have been put on, it will become wrinkled, and on a cool night succeeding a hot day, it will make noise enough to keep a *nervous* man awake. Respectfully yours,

WM. W. VALK, M. D.

P. S. I planted five acres in corn about the 25th last May, put it in drills 3½ by 1 foot. Soaked the seed in a strong solution of nitre, and to half of it, added as much lime as would adhere. The limed portion came up first, and was 6 inches high when the other was but 1. I counted the seed, and found that it took 120,000—half were pulled, leaving 60,000 to grow. It is now from 9 to 11 ft. high, and promises a *large yield*. Six rows of the "*Chinese tree corn*" are now growing opposite to the above, and merits no further notice than to say it is an abominable "humbug." W. W. V.

The Philosophy of Breeding.

Mr. Buel—Will you be so good as to answer the following question? Will a sow of one breed of hogs, and a boar of another, produce a mixed breed? or will they take after the boar or sow so as to show which they are? It is a question of much doubt, and one which should call forth investigation, as it will throw much light on the best manner of getting a good breed. My impression is, that they will not mix, and if that is the case it would be better to keep the original breeds to themselves, as their habits would be more congenial. If my opinion, in this case, should prove to be correct, the attempt to cross must inevitably be a serious injury; for example, if one half of your stock should be the wood or hunting hog, with long legs, narrow backs and slab sides, and never get flesh enough to prevent them from travelling at least forty miles per day, and the other half with short legs, broad and heavy, and could not travel one-fourth of that distance, the food for one not suitable for the other, and their tempers by no means alike, what might we expect from an unsuccessful attempt at amalgamation? Yours respectfully,

STEPHEN McCORMICK.

Auburn, Fauquier Co. Va. August 28, 1839.

ANSWER.

The progeny of a sow and boar of different breeds, will be a mixed bred, generally partaking more of the male than the female parent, at least in the exterior appearance. If the farmer has a good breed, therefore, he should cross it with a better, or with one at least as good. If he has the wood or hunting hog, he should make no cross, but buy and breed from both male and female of improved breeds. A hunting hog will not give half so many pounds of pork for five bushels of corn fed to him, as will an improved Berkshire.—*Cond. Cult.*

A proposition to be considered.

Rahway, Sept. 12, 1839.

Mr. J. Buel—Dear Sir—You have informed the readers of the Cultivator of your intention of closing the present volume of that valuable journal in December, and I presume not one of them have objected to it.—You also shew us the cheapness of it, compared to other journals, and also compared to the other back volumes, which were published at lower prices. The favor that I am about asking of you, will put you in mind of the *old proverb*, "Where much is given, much will be required." I flatter myself, that it will meet the wishes of all your subscribers: at all events, it does of those with whom I have conversed upon the subject, if it will not incur too heavy an expense upon yourself. It is this: that you will give us the next volume of the Cultivator folded in the form the Farmers' Cabinet of Philadelphia is folded. It will make it much handier, and altogether a much better proportioned book, and may occupy the front of the book-case, where it will be always at hand as a book of reference. But its present size prohibits its occupying the place it deserves; and the expense of getting it bound (in a manner the book-binders term half-binding) is one dollar, which equals its first cost.

I have taken the liberty of proposing to you this alteration, knowing that you are always seeking for, and willing to adopt, any plan that would be an improvement. If the present price of the Cultivator will not admit of this alteration, I am confident that your subscribers would all agree to advance the price to $1.25 or $1.50; for at either or these prices it would cost but $2 bound, which is the exact amount it now costs.

Yours very respectfully,

WILLIAM A. STONE.

☞ This matter shall be duly considered, and our determination, with the reasons which control it, given in our next number.—*Cond.*

Small Seed Potatoes.

Rahway, Sept. 12, 1839.

Sir—I have made an experiment this season, for the purpose of ascertaining in what manner small potatoes give the best yield, taking into consideration quality and quantity. For this purpose, I selected 30 potatoes about the size of a black walnut with the shell off, and planted them all in one row; 10 of which I planted whole, 10 with the blossom ends cut off, and 10 cut in two. The product was as follows:

The whole ones weighed,	7lb. 10oz.	good quality.
Those with blossom end cut off,	7lb. 13oz.	better.
Those cut in two,	12lb. 4oz.	best.

WM. A. STONE.

Poudrette and Urate.

[We have already published several communications, showing the value of these fertilizing materials, and we give the following communication in further confirmation of their utility—with the remark, however, that they come too much in the shape of quack medicine certificates; and were we not satisfied, from personal experience, of the great value of poudrette, we should be apt to suspect their impartial character.—*Cond.*]

I, Benjamin Lattin Wood, of the town of Poughkeepsie, carpenter, certify, that in May, 1839, I procured two bushels of poudrette. I made a solution of a part of it, and soaked my oats in it about six hours. I was about three weeks behind the usual time of sowing oats, but gathered them about one week later than my neighbors did their oats. They have only been threshed in part, but the yield from them has been first rate. I planted two rows of the common bush bean in hills about two feet apart, and put about a gill of poudrette to each hill, on or about the 20th May, 1839. Previous to the 23d of August I had gathered one crop of green beans, pod and all perfectly tender. On that day there was another crop ready to be picked, and another crop about one-third grown, and the bushes were in blossom also at the time. I have now had four crops from the bushes, of the first quality of beans, and have never ate better. I can recommend truly the use of poudrette for farming and gardening purposes.

BENJAMIN LATTIN WOOD.

Poughkeepsie, Sept. 1839.

On the 26th August, 1839, Mr. Wood exhibited to me a stalk of the bush bean referred to in the above certificate; he said his family had eaten one crop of beans from the bushes, of which I had no doubt from appearances. There was then on the bush shown me, beans fit to eat, another set about one-third grown, and a great many blossoms. On the 9th of September he stated to me, that since showing me the bush, he had had another crop of beans on the vines besides those shown to me, and that new blossoms were still coming out on the bushes, so that, if not killed by frost, he would, according to the then prospect, have six crops of beans in one season from bush beans to which he had applied about one gill of poudrette to each hill. Such a yield I have never heard of before. The ground on which Mr. Wood sowed his oats, was in good order for a crop, but the influence of steeping grain in the solution of poudrette on vegetable matter, shows the quick and powerful influence which poudrette has where the ground is in good condition. It must not, however, be inferred from what Mr. Wood states, that *mere steeping* would produce the same effect on poor ground; I know it would not, from experiments made. For oats, the application of from 15 to 20 bushels per acre, sown in broadcast before the second harrowing, will be all sufficient. A. DEY.

I, George Walton, of the city of New-York, of the age of 56 years and upwards, do certify, that I have been a gardener by profession from my youth. That in the spring of the year 1837 I planted in the yard of Mr. Anthony Dey, in La Fayette Place, in the city of New-York, four young grape vines, namely, 2 Isabella's, 1 Catawba, and 1 Sweetwater. They grew very little in 1837, and not much in 1838, until some time in the early part of the summer, and after there had been applied about two quarts of poudrette to each vine. The earth was removed from around the roots and the poudrette applied to the roots, and then covered over again with earth. Soon after this application, the vines began to grow very rapidly. This year, 1839, there has been applied at three several times about two quarts each time. The vines have grown very rapidly, and all, except the Sweetwater, have a very large number of bunches of grapes this season, such as I have never witnessed before. The Sweetwater was killed down to the ground, but this year has grown stronger and longer than I ever saw before. I attribute this unusual growth and great quantity of fruit to the application of poudrette. GEORGE WALTON.

New-York, Sept. 11, 1839.

I have conversed with gentlemen who have applied poudrette to the mulberry trees, in *different* ways, and comparing the results, I think the best method is, to put around young trees about a gill or handfull next to the roots, in the manner Mr. Walton did about the grape vines; and the quantity may be increased according to the age and growth of the trees. When so applied, the growth has been quick and powerful.

Sept. 1839. A. DEY.

I, William Henry Wright, of Poughkeepsie, farmer, certify, that in the spring of 1839, I made the following experiments in the use of urate and poudrette.

I soaked corn, part in a solution of urate and part in a solution of poudrette, about 12 hours, according to the printed directions, and some was planted without being soaked. There was a decided benefit in all that was soaked, over that which was not. The grain came up quicker, stronger, and of a dark green colour, and grew with great rapidity, and the yield from it was greater.

On other hills of corn and potatoes about a gill was applied to each hill, and the effect was quick and powerful, and have never applied any manure that was to be compared with it in its beneficial results. The potatoes were superior to any I ever saw, both in quality and quantity, and at least two weeks earlier than common.

I soaked also oats about 12 hours, and some not so long, but the result was the same, as applied to the corn, a decided superiority over that which was not soaked, on land in the same condition.

I soaked timothy and clover seed a few hours in Poudrette, and rolled it in lime; the seed has come up well, and there is a manifest difference between it and some that was not soaked. And on the whole, I can recommend it as the best manure I ever tried.

WILLIAM H. WRIGHT.

Poughkeepsie, Sept. 1839.

I have watched with great care and attention the several crops referred to in the certificate of Mr. Wright. The corn was planted from about the 20th of May, 1839,

to the first week in June inclusive, some with poudrette in the hill, and some without any poudrette; *but where lime and barn yard manure had been put on the land.* After the corn had been planted about three weeks, I measured some of it, and found that where poudrette in the hill had been applied, it was at least as large again as where no poudrette had been put. The corn with poudrette on it came up apparently stronger, with a dark, rich, green colour, and ripened from two to three weeks earlier in the field than it did in the garden where no poudrette had been applied. On the 18th of August, corn from the field was brought on the dinner table, and was found too hard and ripe to eat as green corn; and therefore I dare presume to say, *that corn, manured with about one gill of poudrette in the hill, even in our worst and coldest summers in which we have been afflicted with frost,* would have ripened sufficiently early to make an entire crop. It was sufficiently ripe on the 1st September to be cut up by the roots and put in shocks to ripen complete. The Mercer potatoes with poudrette ripened some two weeks earlier than other potatoes; and I never ate finer or saw larger potatoes in the month of August. A. DEY.

September 13, 1839.

EXTRACTS.

Experiments with Manures.

[*From the Essex Agricultural Society's Transactions.*]

DANIEL PUTNAM'S STATEMENT.

To the Committee of the Essex Agricultural Society, on Experiments on Manures:

GENTLEMEN—The following account of experiments in the use of unbleached *wood ashes* as manure, is submitted, that you may make any use of it which in your judgment will render it serviceable to the farmers of the county. In the latter part of August, 1837, I broke up about one acre of low land, (too low and wet to till with ease,) which had become so much bound out that it yielded not more than 14 or 15 cwt. of hay, and that little was of poor quality. After ploughing, I rolled this land, and then dressed it with 40 bushels of wood ashes, mixed with wash (mostly sand,) from the road-side, making probably about one and a half cord; sowed half a peck of herds grass and three pecks red top seed; then harrowed thoroughly and rolled. The seed took well. In 1838, I obtained from this piece of land 35 or 40 cwt. of very good hay, mostly herds grass.

In November, 1834, I broke up a field, dressing it with about four cords of manure to the acre; on a part turning it under the sod, and the remainder putting it on the furrow. In 1835, planted with corn, the crop large; in 1836, without mowing the sod, sowed oats and hay seed. Obtained 40 bushels of oats to the acre. The hay seed took well, but in the following winter was killed by ice forming and remaining long upon the field. In 1837, obtained not more than 15 cwt. of clover to the acre. Thought I must take this field in hand again. In April, 1838, ploughed an acre and a half of it, rolled, dressed with forty bushels of wood ashes, unmixed with any other material, to the acre; sowed oats and hay seed. The oats had a fine growth and the hay seed came up well, but (for I think it best to tell the *whole*,) the rust which visited my neighbors' oats was not kept out of my field by the ashes; I mowed for foddder before the crop had ripened; there was growth enough for forty bushels to the acre. The young grass, too, did not find the ashes a matchless sanative, for its sickness, (in the scorching weeks of August,) which a draught of pure water would have cured, proved mortal.

Shall I tell you, too, what virtue there is in bones? From Mr. Ward, of Roxbury, I obtained, last spring, 20 bushels ground bone, (cost at Roxbury, 35 cents per bushel,) sold one bushel to a neighbor; mixed the remaining 19 bushels with about one cord of soil taken from the side of the roads in the fields where the mixture was to be used. Some of it was used in ten or twelve days after it had been mixed, and some remained in heap five or six weeks. About the 10th of May, when planting corn where four cords of manure to the acre had, the pervious autumn, been turned under the sod, and where I was putting four cords to the acre in the hill, I selected four rows through the centre of the piece, in which I put the bone mixture, at the rate of fifty bushels bone to the acre; no other manure *in the hill*. The corn here looked as well through the season as on the remainder of the piece, and ripened a little earlier. At the time of harvesting, 104 hills on bone yielded 184 lbs. of corn on the cob. The same number of hills in the adjacent rows on manure, yielded 188½ lbs. That on the bone was the dryest at the time of weighing.

The first week in May, I planted a piece of corn, where I put three and a half cords of manure upon the furrow, and four cords in the hill, to the acre. Through the centre, I left four rows until about the 10th of May, when I planted them with bone, as in the other piece. Here, from 66 hills on bone, I obtained 90 lbs.; from 66 on manure, 96 lbs. Here, too, the corn on the bone ripened earlier, and of course weighed less.

May 21st, when planting potatoes, where four cords of manure to the acre had been turned under the sod the previous autumn, and where I was putting five cords to the acre in the hill, two rows were planted on bone, fifty bushels to the acre. This ground was furrowed only one way, and the hills on the bone happened to be put nearer to each other than those on the manure. When dug, *equal quantities of ground* were taken; of bone, 14 hills; of manure, 12 hills; the bone yielded 55 lbs.; the manure 52.

Between the 15th and 20th of May, I sowed sugar beet, in drills, three feet apart. In some used barn manure, six cords to the acre; in others muscle bed or sea marl, five cords; in others bone, fifty bushels. Three drills of each kind, about three rods long, yielded as follows, viz: from barn manure, 247 lbs.; muscle bed, 355.; bone, 337½.

At the same season I sowed carrots on barn manure, muscle bed and bone. Barn manure, six cords to the acre; muscle bed, 4; bone, 50 bushels. Some of the bone and the other manures were spread broad-cast, and a part of the bone was put in the drill; rows fourteen inches apart. Two rows of each kind, three rods long yielded as follows: barn manure 75 lbs.; bone in drill 105 lbs.; bone spread 82 lbs.; muscle bed 83½ lbs.

I sowed with ruta baga, June 1st, ten drills, three feet apart and fifteen rods long; five drills on barn manure, part of it fresh from the barn cellar and part partially decomposed, nine cords to the acre. The other five on bone, fifty bushels to the acre. Those on the bone were less eaten by the fly than the others, though the others were not very badly injured. A strip (17 feet in length) across the drills, where five had bone and five manure partially decomposed, yielded, bone 248 lbs.; manure 228 lbs.

Another strip 16½ feet long, where there was bone and fresh manure, gave, bone 212 lbs.; manure 227 lbs.

About the 10th of June, I sowed ruta baga on reclaimed meadow land; drills three feet apart; manure nine cords to the acre; bone fifty bushels. Soon after the plants came up, those on the barn manure were nearly all destroyed by the fly; it was necessary to sow a second time. Those on the bone were but very little injured. Four drills, two rods long, on bone, yielded 486½ lbs.; four on manure 439 lbs.

DANIEL PUTNAM.

North Danvers, Dec. 5, 1838.

MR. HOW'S LETTER.

Methuen, December 5, 1838.

DEAR SIR—In compliance with your request, I suggest a few ideas, on a subject of no small importance; for success in farming depends principally on the quantity of manure that is made. And, in fact, a locomotive may as well be propelled without steam as a person have good success in farming without manure. There are various ways by which manure may be increased. Cellars under barns for the reception of manure are highly important, as its value is much increased by being preserved from drenching rains and drying winds. Also, the quantity may be much increased by hauling muck or soil, or throwing in hay, straw, or some other materials to receive and suck up the urine, as this is supposed to be worth nearly as much as the droppings. A suitable plan for a cow yard is of no small importance. It should be much hollowing in the middle; the sides so elevated as to prevent the water from running in, consequently there will be but little to run out, to wash out the manure. A large quantity of manure may be made in such a yard, by hauling in muck, soil, or some other material, and ploughing or pitching it over occasionally. But it is said, we have no meadow from whence to get muck; there are no scrapings in the road to be collected; therefore, we have nothing to make compost of. But I would say, if they have nothing else, take the soil from the field, and with a little additional manure, the field may again be restored to its former fertility. Another object of some importance is to have the manure applied in the best manner. I have until recently been of the opinion that it is best to be applied in a green state, and have the fermentation take place in the ground; but of late I have had a different opinion, although I have tried no experiment that is satisfactory in my own mind. I would suggest the idea of recommending a premium to be offered for the best experiment on the application of manure, that it may be ascertained which is the most profitable, to apply manure in a green state or to make a compost of it by mixing other materials, taking into the account all the additional expense of labor.

Another thing is, to keep the hogs at work. By keeping a good supply of hogs and accommodating them with materials to work with, they will add much to a farmer's stock of manure.

Some farmers are averse to the credit system; to supply their hogs with materials to work with; to fill their cow yards and barn cellars with muck, &c. and to give one, two, or three years credit is too much. This is one important reason why so little improvement is made in farming. I believe there are the materials on almost every farm, and means within the reach of almost every farmer, to enrich his farm to almost any extent.

Suppose a person to make a certain additional quantity of manure; consequently in the same proportion the products of his farm will be increased, from which, by spending on the farm will again increase the manure, and so on, until his farm may be enriched without limit. Finally, I believe that if all the farmers would pay their attention to making manure and enriching their farms that their interest requires, the western fever would be less prevalent among us, and our young men, instead of leaving the farms of their sires and engaging in speculation, or emigrating to the far west, would cultivate the land of their fathers and learn from experience that they may be amply repaid for all their toil, and that the cultivation of the earth is second to no other employment. Yours, with sincere respect,

JOSEPH HOW.

Vegetable Kingdom,

A term including all plants and roots which grow above and under ground; being nourished by the air, water, &c.

Vegetables may be considered, botanically, as to the apparent parts of the plant, of which we have already treated under *Botany:* or physiologically, as to the organization of the plant: or anatomically, as to its component, or chemically, as to its constituent parts.

In treating of Botany, we have given an account of the parts employed in classification according to the prevailing systems of *Linnæus* and *Jussieu;* the one founded on the sexual organs, the other on the cotyledons that envelop the seed.

Physiologically, a plant may be considered as composed of roots, stem, branches and leaves.

The roots are formed by the growth of that part of the seed called the radicle, whether by extension of parts already formed, or by apposition of new parts derived from the food according to the laws of organic crystallization, is not accurately known. The roots are the mouths of the plant: by the property of irritability dependent on organization, they are attracted to move in that direction where food is to be found.

The food of plants consists in those substances only which are found by experiment to be universally, in all cases and in all places, the component parts of a plant, viz. carbon, hydrogen, oxygen, sometimes azote and alkali. The siliceous, calcareous, and magnesian earths, the earthy salts, and the iron and manganese found in plants, vary in quantity according to the circumstances of soil, climate, and manure artificially applied. All of them may be wanting in a plant, and yet the plant be perfect. Hence manures that increase the substance of the plant, are such as are decomposable into carbon, hydrogen, oxygen, azote and alkali: the other kinds of manure, are those that stimulate the irritable fibre of the plant to stronger action, as salt, plaster, lime, &c.—those that increase or decrease the tenacity of the soil in which plants grow—those that act by increasing or decreasing the capacity of the soil to retain moisture.

Plants, however, do not exclusively feed by their roots. A very great part of the nutriment of all plants is derived from the carbonic acid of the atmosphere, which the leaves decompose, feeding on the carbon and throwing out the oxygen—and form the atmospheric moisture which the leaves drink as well as the roots. The effect of atmospherical electricity, as a stimulant or a sedative, we have not facts enough to form any opinion upon. Light is certainly consumed by plants, and enters into their composition, being almost the only source of colour, and probably of the light emitted during combustion. Leaves also perform the office of lungs to a plant.

Plants may be considered anatomically, as composed of the epidermis, the thin skin that covers the bark—the bark analogous to the skin of animals—the wood (liber)—the pith—the sap—the tracheæ or air vessels—and the cellular tissue, analogous to the cellular membrane of animals.

The systems of the vegetable are analogous rather than similar to those of animals: they have the woody stem, analogous to the osseous system of animals—a system of vessels for the sap to ascend—another wherein the recent sap is eliminated into the peculiar juices of the plant, analogous to our glandular system—a system of vessels wherein the charged sap descends and nourishes the plant—leaves analogous to lungs—and excretory vessels, as well as the secretory vessels which we have noticed as analogous to our glandular system.

Plants are young, grow by feeding, digesting, and assimilating their proper food; they arrive at adult age and full growth, they beget offspring by sexual commerce, they are subject to disease, to accident, to be preyed upon by parasite plants, to grow old and die.

They have irritable fibre, analogous to our muscular fibre, and like this, contractile on the application of stimulus. It has not yet been ascertained, that they have any system analogous to our nervous system, hence they have not (so far as we know) any apparatus to authorize us to ascribe to them sensibility, sensation, or voluntarily: though in some plants noticed by Dr. Smith, the English Botanist, when one part is stimulated a distant part contracts, so as to suggest a common sensorium.

All these properties of plants, depend upon their organization: they are developed as the organization is developed, they are complicated and perfect in proportion to the organization; they are injured when the organization is injured; and they disappear when the plant becomes disorganized; analogously to the faculties or properties called mental in man. What is the immediate cause of organization, vegetable or animal—or in what way that principle causes an assimilation of parts derived from the food employed for nourishment—or whether the lowest forms and modes of organized matter depend on accidental apposition or approximation of particles separately unorganized—we know not in our present state of knowledge. Whether life depends on the property of organization, or the property of organization on communicated life? are questions, curious, but useless, in proportion as they are abstruse.—*Domestic Encyclopedia.*

Wintering Bees.

[*From the Genesee Farmer.*]

MR. TUCKER—Agreeably to your request, I called on Mr. Eggleston, and obtained from him the following statement of his method of wintering bees, and the success attending it.

In the fall of 1837, he buried 30 or more hives, and the following spring they were taken out without the loss of any. In 1838 he buried 10 hives, with the same success, but lost 7 or 8 hives of bees that stood in his bee-house through the winter. He says that he finds very few, or no dead bees under his hives that are buried, and that they winter on much less honey than when left in the house; some small swarms have lost but 3 lbs. in weight in wintering, and the largest but 10 lbs. He has buried his bees or some of them, each year, for four years past, and has not lost a swarm that was buried, and shall hereafter bury all that he intends to winter; he has now about 40 swarms. Another fact—those that are buried do much better, and swarm much earlier in the spring.

Mr. Eggleston's method of burying his bees, is to dig a shallow trench in the ground, long enough to set the number of hives he wishes to bury, with a gentle slope in the trench, to carry off the water if there should any collect, and then place the hives in the trench, raised a little from the ground by a small stone under each corner of each hive, then covers them with straw and lastly with dirt, to use his expression, as you would a pile of potatoes, so deep as not to freeze under the hives.

As to the success of Mr. Eggleston in preserving bees, as described above, there can be no doubt, as it is known to all his neighbors, who (if necessary) will certify to the facts as stated. Yours, respectfully, ANSON ANDREWS.

Reading, August 20, 1839.

Agricultural Geology.

[*From Prof. Jackson's Third Geological Report.*]

CONCLUDED.

In order that a plant should absorb the requisite nutricient matters, it is essential that its rootlets should have free play, and hence the necessity of a proper texture in soils. It is also requisite that the materials should be rendered in some degree soluble; and that the soil remain permanently good, it is essential that it should not be too loose in its texture; for, against the opinions of some farmers, I still maintain that the principal and most active ingredients of manures and soils, are lost by solution and infiltration; the evaporation being as it were but a drop in the bucket. On this poin

however, I shall present some considerations hereafter.— There is also another property of soils too generally lost sight of, namely, their electro motive power, and their influence in this manner, upon the absorbing spongioles of the radicles, producing the effect called by M. Dutrochet, *endosmose* or *internal impulse*. This effect is most assuredly produced by those mixtures and combinations of mineral matters and salts, with vegetable humus, which characterize luxuriant soils. Here, then, is a new field of research for the philosophical farmer, who will find the still small galvanic currents which take place among the particles of soil, are busy preparing his bread. The influence of electricity has long been known to hasten vegetation, and plans will ultimately be adopted to bring the results of the laboratory into the hot bed and green house, while a contemplation of the phenomena will illustrate those great natural laboratories—the corn-fields of the farmer. A soil consisting of *one kind of earth, is barren*—no matter of what earth it may be composed, whether silex, alumina, lime or gypsum. *Pure vegetable matter, is also barren; but proper combinations or mixtures of three earths, always produce fertility*, provided the *pabulum* or food of the plant be present also. Certain saline matters are said to stimulate plants, and by this I understand that they produce electrical movements or endosmose, for they will act in a similar manner upon dead or inorganic matter, as seen in Dutrochet's experiments. By saline stimulants, the foliage of plants is rapidly and substantially developed, owing to the absorption of carbonic acid gas from the atmosphere, and the retention of its carbon, while the oxygen gas is exhaled by the green leaves. And since such stimuli tend only to the development of the foliage, and act against both germination and ripening, the proper time to apply such substances, is after the plant has shot up, and before it begins to ripen its seeds or fruits.

These principles are generally unknown to farmers, and hence their unskilful appplication of gypsum, salt, &c. as dressings to soils. They also neglect to consider the native *habitat* of their plants, and hence often apply the wrong stimuli. Now it is evident, that since asparagus plants, onions, cabbages, and similar vegetables, are native plants of the sea-coasts of those countries, to which they are indigenous, that if they are to be cultivated in soils free from saline matter, salt may be advantageously used in small quantities, to render them more luxuriant. Gypsum and sea salt have nearly the same effect upon plants, and hence when the soil derives saline matter from salt-water spray, or vapor, gypsum will not benefit the soil, or act as a stimulant upon plants.— This opinion, which is proved in the Prize essay of Professor Le Cocq, on saline manures, explains the fact well known in Maine, that gypsum exerts but little action upon the soils near the sea-coast, but does act favorably on the soils of farms situated in the interior of the State, especially on those which contain small quantities of carbonate or geate of lime.

As I have formerly stated, it is evident from an examination of the mineral ingredients of soils, that they *all originated from the decomposition and disintegration of rocks, which for ages have been acted upon by air and water;* those agents having, by their mechanical and chemical powers, shivered and crumbled the solid ledges into those pulverulent matters which form the basis of all soils—to which, subsequently, small quantities of vegetable humus are added by the decay of plants.

Ancient soils. There have been various epochs in the earth's history, when soils were thus formed, and after bearing their luxuriant vegetation, were reconverted by aqueous and igneous causes, into rocks, the structure, and fossil contents of which, denote their origin to have been from sedimentary matter, hardened by pressure and heat. Thus, when we look back to the epoch of the transition formations, we find the rocks composing that series to be composed of agglomerated sand and pebbles, cemented by clay, which presents itself in an indurated form, the results of igneous action. Marine shells, contained in the graywacke rocks just described, evince that this deposite was chiefly formed beneath the waters of the sea, while some portions of it were deposited in fresh water, as proved by the presence of certain plants, peculiar to bogs and lakes. The slates of this formation contain prints and casts of numerous plants—such as ferns, equisetaceæ, lepidodendræ and stigmaricæ; while beds of anthracite coal, shewing by their structure and composition their vegetable origin, are also included between the strata.

Now it is evident, that the above mentioned plants could not have grown without a soil, and the rocks in which they are imbedded bear every proof that they were once in that condition.

Secondary soils. We come next to the secondary epoch; and here again we are astonished to find proofs of a numerous succession of alternating beds of soil, each having, for long periods of time bore their perennial verdure of intertropical plants, allied to those above noticed, but more complicated and perfect in their structure. The sandstones and shales of this formation are vast herbariæ of ancient vegetation, and their strata contain, well preserved between their sheets, perfect impressions of numerous genera of plants, the species of which are now extinct. Large trunks of trees are also exposed by opening coal mines and quarries of sandstone, while the numerous and reiterated strata of coal itself also bear ample proofs of their vegetable origin.

Here, then, we have another epoch, at which soils existed, produced their abundant vegetation, stored the earth with fuel, and then were reconverted into solid rocks, to be again subjected to the wear and tear of elemental strife.

The tertiary epoch was of a milder character, and but little disturbance of the solid rocks appears to have been effected during those submersions, when the plastic clay, calcareous marls and strata of perfectly preserved marine shells, were deposited. These sedementary matters appear to have resulted from a slow and gradual deposition of clay and other fine sedementary matter, which beneath the sea became soon inhabited by numerous shell fish, and were imbedded in succession as we now find them, since the elevation of the land above the encroachments of the sea.

When we consider the several periods which I have briefly mentioned, it will at once reveal to any reflecting person, that the world has been during the lapse of inconceivable ages, subject to great revolutions in its geological organization. At one time, the rocks are worn down into soils, and bear their vegetation—then continents were sunk in the ocean's depths, and subsequently were raised again, the soils having in the mean time, been converted into rocks. By such considerations, we soon learn to respect the antiquity of the world; and knowing that such records are legibly written on the tablets of stone, we feel a natural desire to read and understand their meaning.

Ancient alluvial soils, or diluvium. Subsequent to the epochs of which I have spoken, we find that another scene of violence disturbed the tranquillity of the great deep, and the northern ocean was hurled, with its seas of ice, over the land, sweeping the loose materials from the very mountain tops, and depositing them far south of their former resting places—while the grooves, scratches and water marks upon the surface of the fixed ledges, shew the direction in which the current passed. By such a flood, (proofs of which are nearly universal in Maine, as elsewhere,) the soils were transported and commingled, so that we rarely find a soil similar to the rocks beneath it, but identical with that derived from other rocks, which occur to the north and northwest.— Having already cited so many localities in proof of this position, I shall not here recapitulate, and the intelligent observer will find so many illustrations in Maine, to satisfy his rational curiosity on the subject, that he need not long remain in doubt as to the facts.

Modern alluvial soils. The present causes which act upon the solid rocks, are both chemical and mechanical.— Oxygen, from the atmosphere and from water, is constantly affecting some portions of the work, especially where the rocks contain pyrites. Rivers, torrents, brooks, and even rain, are gradually sweeping away the solid rocks, by their continued action; but more powerful than all others, is the action of freezing water, which, by an almost irresistibly expansive force, rends all rocks, into which water can find a passage, and crumbles down those which are porous in their structure. Upon the coast, the sea ever beating the solid rocks and hurling the loose fragments with the force of battering ordnance against the shores, wears away the ledges, the detritus being either spread out on the bottom, or sifted up at the mouths of harbors and estuaries.

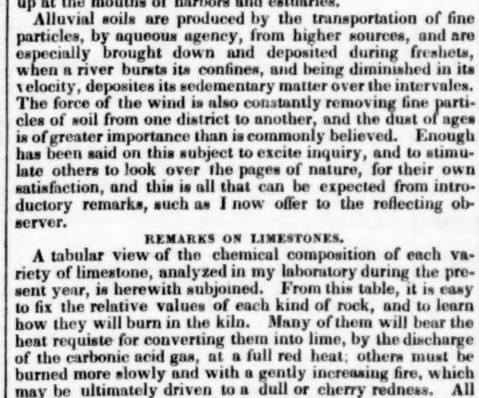
Alluvial soils are produced by the transportation of fine particles, by aqueous agency, from higher sources, and are especially brought down and deposited during freshets, when a river bursts its confines, and being diminished in its velocity, deposites its sedementary matter over the intervales. The force of the wind is also constantly removing fine particles of soil from one district to another, and the dust of ages is of greater importance than is commonly believed. Enough has been said on this subject to excite inquiry, and to stimulate others to look over the pages of nature, for their own satisfaction, and this is all that can be expected from introductory remarks, such as I now offer to the reflecting observer.

REMARKS ON LIMESTONES.

A tabular view of the chemical composition of each variety of limestone, analyzed in my laboratory during the present year, is herewith subjoined. From this table, it is easy to fix the relative values of each kind of rock, and to learn how they will burn in the kiln. Many of them will bear the heat requisite for converting them into lime, by the discharge of the carbonic acid gas, at a full red heat; others must be burned more slowly and with a gently increasing fire, which may be ultimately driven to a dull or cherry redness. All those marked as good, will slake perfectly, after being burned, and are sufficiently pure for all ordinary uses. They are generally free from magnesia, and hence are better adapted to agricultural use, than the magnesia limestones. Magnesia will remain a long time exposed without absorbing its equivalent of carbonic acid, and thus it does not act favorably, excepting when thoroughly saturated by the fermentation of compost, or by long exposure to the air. When such limestones are skilfully managed, they answer nearly as well as the pure lime. The argillaceous matter contained in some of the limestones, that occur imbedded in slate rocks, does no harm to the soil, and is even beneficial in some cases. The Dexter and Guilford limestones will make a good and strong mortar, and will also prove very valuable in making compost, or for the treatment of soils by liming. So will also many of the other varieties hereafter mentioned in the tables.

Under the description of each locality, I have made ample observations on the nature of the lime-rock, and shall here present some views or plans of such kilns as may be required for the conversion of the rocks into quicklime.

[Fig. No. 40.]—15 feet.



Lime Kiln for burning 300 casks of lime at a time.

Fig. 40. Kiln built of refractory rocks, lined with clay, and laid outside with mortar—fifteen feet wide—fifteen feet high —five feet back. Arches—middle, five feet high—side arches, three and a half feet high.

This kiln is of the form commonly used at Thomaston, and the lime is burned by means of wood fuel—thirty cords of wood being required to burn the charge of rock. The operations are divided into four turns, and from three to four days and nights the fire is kept unremittingly in action. At the close of the operation, the limestone is found to be converted into caustic lime. A more full statistical view of this business, may be seen in my former Reports on the Geology of Maine. It is necessary, in case the rock is liable to slag, that it should be broken into pieces of pretty uniform dimensions, or at least, care must be taken to place the larger masses near the fire, and the smaller ones more distant from it. The arches are to be built up of large angular pieces of the rock, not more than six or eight inches in diameter, and they must be laid loosely, so that the flame may penetrate freely through them, and act upon the superincumbent mass of broken lime-rock. I have seen some persons break the limestone in the kiln. This should never be done, for the small pieces fill up the interstices in the charge, and prevent the passage of flame and heated air, required for the draft of the kiln.

In laying the arches of limestone, make them coincide with the arches of the kiln—pack the pieces so as to allow the passage of the fire, and lay the limestone in a very loose manner, until the kiln is half full. Then you may throw in the smaller pieces in confusion, and fill up the kiln to the top. This being done, place your fuel in the arches and kindle your fires, and drive them until the lime is sufficiently burned, which may be from three to four days and nights, according to the kind of rock, and the intensity of the fire.

A smaller kiln may be required in some towns, and in cases where the farmer burns his lime for his own use only. I therefore, herewith present a plan for such a kiln.

[Fig. No. 41.]

This kiln is of a cylindrical form, rather wider outside at the bottom than at the top, so as to give it more solidity. It is ten feet high, and five feet in diameter at the top, while the bottom internally contracts a little, so as to support the charge.— This contraction is unnecessary, excepting where the limestone crumbles or "*fine burns*," during its calcination. The arch may be made four and a half or five feet high, and two and a half or three feet wide so as to allow room for discharging the lime, after it is burned. The kiln may be made of any rock, capable of withstanding a full red heat. Talcose slate, mica slate, or even common clay slate, will answer. It must be pointed with clay inside, and with mortar on the outside. In charging this kiln, the stone is broken into suitable sized pieces, and an arch is built up, corresponding with the arched opening and extending quite across the diameter of the kiln. Having laid up this arch loosely, pack the kiln in a careful manner, until it is half full of the broken limestone; then you may throw in the smaller pieces on the top, and fill the kiln entirely. It is now set for burning, and you have only to place the wood and kindle a fire in the arch, keeping the heat gradually increasing, until the limestone is sufficiently burned. This may be known either by the time required, or by the appearance of the pieces at the top of the charge. It will generally be noticed, that when the fire has done its office, that the smoke ceases to appear at the top of the kiln, and a flame rises through the interstices at the top. The charge begins also to settle a little. The time required for the burning of lime, varies with the different kinds of lime-rock, and hence it is alone to be learned by experience in a particular case, and with the kind of kiln with which the lime burner is acquainted. One or two fair trials, will teach any intelligent man how to do the work in a proper manner.

The cost of the lime prepared in a small kiln, is always a little more than when it is made in a large way; hence where an extensive demand exists, the three hundred cask kiln would prove the most profitable to the manufacturer.— Most of the limestones here described, may be burned at the cost of twenty-five cents per cask, in bulk—or for fifty cents, packed in casks. Where it is to be used on the spot, in agricultural improvements, it may be thrown out of the kiln, and allowed to slake itself, and then is ready for immediate use. Its weight is increased from thirty to fifty per cent by slaking, and its bulk is tripled or quadrupled; hence, where it is to be transported to a distance, it is better to take it in its caustic state, either in bulk or in casks.

A shed ought to be built near the kiln, so as to keep the lime under cover, to prevent its being wet by rain.

Rock, fresh from the quarry, burns more easily than after it has become dry by laying exposed to the action of sun and air.

Limestones, containing pyrites, like that at Brown's corner, in Clinton, give out sulphurous acid gas during the process of burning, and in such cases, it is unpleasant to have the kiln near the house. In all cases, at the commencement of the operation, much smoke is produced, and it is, therefore, convenient to place the kiln where people are not likely to be annoyed by it. When driving the fire in a lime kiln, you perceive that the limestone melts or slags, you must not increase the heat beyond that point.

Poor limestones are frequently burned best by means of wood that is not perfectly dry, so as not to burn too rapidly. A little experience and discretion, however, will teach any man how to regulate the fire, so as to make the best kind of lime.

By examining the tables, knowing how one kind of limestone burns, you may judge of the others which are there presented. Nearly every variety of limestone found in Maine, I have burned in my laboratory, and know, practically, exactly how they will burn, and the quality of lime that will result. Where the oxide of iron is more than two per cent the lime will have a brownish tinge, so as to render it unsuitable for plastering ceilings. The slate is merely inert, and gives an ash grey colour to the lime, where it abounds.

Silex, when chemically combined with the lime and oxide of iron, forming what are called by chemists *silicates of lime and iron*, produces a hydraulic limestone, liable to melt at a full white heat. It is frequently a valuable article for making hydraulic cement, and abounds in several places in the State, especially at Machias, and at the forks of the Kennebec river. Many of the rocks described in the catalogues appended to this Report, as calciferous slates, will also make hydraulic lime. They may be burned at a red heat, but beyond that temperature run into a deep green glass or slag.

Tabular View of the Analyses of Limestones collected during the Geological Survey of 1838.

Number.	Locality.	Variety.	Cabonate of Lime, per cent.	Insoluble matter, per cent.	Oxyde of Iron, per cent.	Lime, per cent.	Remarks.
1	Abbot: Ira Witherum,	Blue—dull, - - -	74.0	24.8	1.2	41.9	Good.
2	Athens Road, - -	Greyish white; crystalline,	70.4	25.2	4.4	39.6	Good for agriculture, makes brown lime.
3	Athens Village, -	Bluish, compact, - -	72.6	2.8	....	40.8	Good for agriculture, slags at white heat.
4	Bingham, - - -	Reddish brown, dull; micaceous—hard, - - -	42.6	55.8	0.6	24.4	Poor, not worth burning for lime.
5	Carthage: B. Winter, -	Light grey; granular, containing mica, - - -	89.8	8.8	1.4	50.4	Bears full burning; good for mortar and for agriculture.
6	Do Mr. Reed, No. 2,	Reddish white, - -	76.2	23.4	0.4	42.8	Good; burns easily; liable to slag if [over-burned.
7	Clinton: J. D. Burrell,	Bluish grey, slaty, - -	47.2	50.4	2.4	26.5	Poor; burns at red heat; slags; makes brown lime.
8	Clinton: L. Brown, -	Bluish, containing slate and pyrites, - - - -	5.40	43.0	3.0	30.3	Slags at full red heat; makes brown lime; rather meagre, but good for agriculture.
9	Clinton: A. Brown, -	Blue, interstratified with thin folia of slate, - -	76.8	17.2	0.6	43.1	Good; bears full red heat; makes a fair lime.
10	Dexter: E. Crowell's, -	Blue, interstratified with thin folia of slate, containing small veins of calc. spar, -	90.0	8.6	1.4	50.6	Very good; bears full red heat; makes nearly white lime.
11	Dexter: Mr. Fish, - -	Bluish, mixed with small veins of quartz and slate, -	89.2	9.6	1.2	50.1	Good; like the above.
12	Dexter: L. Pullen's, -	Bluish, compact; interstratified with thin folia of slate, -	78.2	20 0	1.8	4 0	Good; but not quite so strong as the pre- [ceding.
13	Dexter: John Puffer, -	Bluish, slaty; compact, -	84.0	14.4	1.6	47.2	Good; makes strong lime.
14	Dixfield, - - -	Bluish, with crystals of actynolite, - - - -	69.4	29.2	1.4	38.9	Burns at red heat; slags at higher temperature; slakes coarse.
15	Dover, south side of river,	Bluish grey; mixed with slate, calc. spar and qurtz, -	70.6	25.4	4.0	39.7	Burns at a full red heat; slags at white heat; makes brown lime.
16	Dixfield: Mr. Holman's,	Dark bluish grey, dull; micaceous, containing small crystals of actynolite, - -	79.6	20.0	0.4	44.7	Burns solid at a full red heat; slags at white heat; good lime.
17	Dover, - - -	Bluish grey; seams of calc. spar, containing slate and quartz,	70.6	25.4	4.0	39.7	Not so good as the above; makes brown lime.
18	Farmington, Titcomb's Hill: J. D. Coney's,	Dull bluish; mixed with slate,	88.8	6.4	4.8	49.4	Bears a full red heat; slags at a white heat; makes brown lime.
19	Farmington Hill: D. J. Coney, - - -	Bluish, slaty; mixed with mica slate, - - - -	84.4	14.4	1.2	47.4	Like the above; but makes a better colored lime; ash grey, white when slaked.
20	Forks of Kennebec: Mr. Foster. Recommended for hydraulic lime, -	Buff-colour; compact, stratified,	45.4	silex 27.0 a3.2	*	30.5	Good for hydraulic lime, to be burned at red heat. Runs into glass at white heat.
21	Foxcroft Falls, -	Light blue; containing calc. spar, pyrites and slate, -	35.6	62.0	2.4	19.9	Too poor for lime, but will answer for flux to iron ore.
22	Foxcroft: Cave near river,	Bluish; interstratified with slate containing pyrites, -	48.8	47.8	3.4	27.4	Poor; good only for flux to iron ore.
23	Guilford: River, -	Dark blue, - - - -	84.8	13.8	1.4	47.6	Good; bears a full red heat; makes white lime; will answer for all ordinary uses.
24	Hampden, - - - -	Blue, slaty, hard; not good,	5.0	93.2	1.8	2.8	Turns red in the fire; is not suitable for lime.
25	Harmony, - - - - -	Bluish, slaty, - - -	61.4	36.4	2.2	33.9	Burns at a red heat; slags at a white heat; makes a poor brown lime.
26	Industry: on Farmington Road, - - - - -	Blue, micaceous, containing blue calc. spar, - -	76.0	21.2	2.8	42.7	Good; bears a full red heat; makes a brown lime.
27	Jay: Mr. Noyes, - -	White; crystalline, containing quartz and actynolite, -	†				
28	Livermore Falls, - -	Grey, with numerous crystals of actynolite, - -	62.8	34.0	3.2	35.3	The lime burns white, but is full of crystals of actynolite, but will answer for agriculture.
29	Mount Vernon, - - -	Greyish white; granular; numerous crystals of actynolite, mixed with mica slate, -	48.8	47.0	4.2	27.4	Bears a full red heat. The lime is white, but is full of crystals, that make it coarse. It will answer for agriculture.
30	New Sharon: J. Bean,	Blue, mixed with mica slate,	53.8	36.0	10.2	33.1	Bears a full red heat. The lime contains brown scales of mica, & is dark brown.
31	New Sharon: J. Winslow,	Light blue, micaceous, -	77.0	20.6	2.4	43.3	Good; makes fair lime, of a brown colour.
32	New Sharon: S. Tollman,	Light blue; micaceous, -	88.2	10.2	1.6	49.6	Good; less brown than the above.
33	Norridgewock: S. Sylvester, - - -	Bluish, mixed with slate,	88.2	10.6	1.2	49.0	Good; burns solid; slakes well; is light brown, but strong.
34	Norway: W. Parsons,	Greenish grey, - -	51.4	47.6	1.0	28.8	Makes a weak lime; slags at full red heat.
35	Norridgewock: A. Wood,	Dark blue, micaceous, - -	51.2	48 4	0.4	28.7	Weak lime; slags at high red heat.
36	Phillips: I. Whitney,	Granular, stratified with dark and light stripes, - -	64.8	34.4	0.8	36.3	Makes good lime; fine, burns a little; will slag at a white heat.
37	Phillips: E. side Co. Road,	Greenish grey, compact, -	67.6	26.8	5.6	37.9	Weak, slags; makes brown lime.
38	Phillips: I. Whitney, -	White; granular, - -	65.0	34.6	0.4	36.5	Like the other variety; fine, burns a little.
39	Phillips: W. side Co. Road,	Greyish white, - - -	5.2	88.2	6.0	2.9	Not good for lime.
40	Poland: N. Bray, -	Greenish white; granular, containing actynolite, -	43.6	54.4	2.0	24.4	Makes brown lime, coarse when slaked.
41	Rumford Falls, - -	Greyish white; crystalline, with crystals of actynolite, -	78.0	20.8	1.2	43.9	Fine, burns; but makes a good strong and white lime; good for all usual purposes.
42	Skowhegan Falls, -	Bluish grey, mixed with a little slate, - - - -	52.6	38.6	3.8	32.3	Good for agriculture, but is brown coloured.
43	Strong: Norton's Mills,	Containing calc. spar, mixed with a little slate, -	90.5	8.4	1.0	50.8	Good for lime; makes a good mortar.
44	Temple: I. Varnum, -	Bluish grey, dull, micaceous, containing spots of iron,	70.2	28.4	1.4	39.5	Burns at red heat; slags at higher temperature; makes light brown lime.
45	Thomaston, Beechwood Q. hard stone, - - -	Stratified with blue and grey stripes, - - -	55.6	2.8	‡1.2	31.2	Burns solid; slakes well; makes good white lime for mortar.
46	Turner: S. Davy, - -	Greyish white; granular; with crystals of actynolite, -	74.6	25.0	0.4	42.9	Good; burns to good lime, but contains crystals of actynolite, and is coarse.
47	Turner: Oak Hill, -	Greenish grey; granular,	40.0	59.0	1.0	23.7	Not good; will not make lime.
48	Union, - - -	Brown; with numerous pieces of hornblend, - -	9.8	32.0	58.2	5.4	Not good for lime.
49	Waterville: Gen. Robinson	Bluish, dull, interstratified with slate, - - - -	47.2	47.2	5.6	26.5	Too weak to make a good lime.
50	W. Waterville: Great Falls	Bluish, interstratified with thin folia of slate, - -	73.8	24.8	1.4	41.4	Good for agriculture; makes lime of a light brown colour; slags at white heat.
51	Do Mr. Crowell's	Light bluish, interstratified with thin folia of slate, -	89.8	9.0	1.2	50.4	Good; makes light brown lime.
52	Winslow: James Wall,	Light bluish grey, with small veins of calc. spar, -	73.8	24.2	2.0	41.4	Good for agriculture; makes brown lime.
53	Winslow: T. Simpson,	Light grey, dull, coated with slate, - - - -	68.4	31.0	0.6	38.4	Burns at red heat; slags at higher temperature; makes weak lime.
54	Do Mr. Drummond's	Blue; interstratified with slate,	81.8	16.2	2.0	45.9	Good; burns at full red heat; slags at white heat; makes brown lime.
55	Winslow: Mr. Forbur,	Dark blue, mixed with a little slate, - - - -	77.8	20.6	1.6	43.7	Good; burns at red heat, and slakes light brown.
56	Winthrop: J. Richard's,	Dark granular, - -	78.8	20.2	1.0	44.3	Good for lime; burns well at intense red heat; makes a solid lime, that slakes well, and is full of scales of mica. It is strong.

* Carbonate of iron 2.8 per cent. Silicate of iron and manganese 2.4 per cent. Magnesia 5.0 per cent.
† Not good—rejected as useless. ‡ Carbonate of magnesia 39.4 per cent.

[We append the following, from Professor Ducatel, as interesting to a portion of our readers.]

"The mode of conducting the operations of the *perpetual kiln* in the state of New-York, in which *anthracite* is burnt. is as follows:—The coal and stone are arranged in alternate layers. The first charge is made by constructing a grate over the *eye* with large stones fitted in loosely and sufficiently apart, to allow the kindling of the coal, of which a layer is first put on: the stone is then *lowered* down upon it, and properly disposed of by hand, and so on alternately with the coal, until within eight feet of the top. The kiln is then fired from below, and at the expiration of four days the whole being ignited, more stone and coal are thrown in. The coal should *not* form a complete layer over, or covering to the stone, but a little more than fill up the interstices between the peices, and care must be had not to allow too much of it to settle round the walls, as the heat would destroy them: the kiln is then finally dressed off with smaller stone. The morning of the next day after this operation, the kiln is opened at bottom, and from 90 to 100 bushels are taken out to be slaked; this is repeated in the evening, and successively every morning and evening without interruption.—When the materials in the kiln have sunk down to within six or eight feet of the top, fresh supplies are added, and this is continued indefinitely.

At Barnegat, as soon as the lime is taken out, it is slaked by using two pails of water for about 3 and 1-2 bushels of lime; and before being shipped, (for most of this lime is used for agricultural purposes,) an additional quantity of water is thrown over it. One ton of coal, it is supposed, will burn over 200 bushels of lime. The lime-burners here are of opinion that the stone may be used indiscriminately, of all sizes, but this is an error; the universal practice in Europe being, to break it down to the size of the fist.

Wood, charcoal, peat, bituminous coal, and especially coke, are also used in *perpetual kilns*, and the arrangement of materials, as well as the relative proportions of each to be employed, will vary according to the nature of both. When coal is used, its layers should be thicker in the centre than on the sides, in a ratio of difference of 4 to 3. In those kilns that are provided with two or more fire-places, choice must be made in kindling of that towards which the wind is setting, provided it be not too strong. It is always important to try to obtain an equal fire throughout each successive layer, —but this is not always easily effected, because it frequently happens, that the combustion goes on more rapidly in one direction than another, which is partly owing to the layer of stone being thicker on the sides, and also less supplied with coal. Those parts of the kiln where the fire has become checked may be discovered, by remarking that in such places the stones are not so discolored by smoke, as where the fire is more regular. The lime-burner is then immediately to turn his attention to those spots, and with his poker clear the impediments to the free circulation of the air. The perfect calcination of the inferior layers of stone, is generally indicated by a great diminution of smoke, which usually takes place when the fire has reached about the three-fourths of the height of the kiln. The practice in Europe is then to take out all the lime that has been made, (being about two-thirds of this same height,) or as high as where pieces of ignited coal are observed intermixed with it. It must be taken out with care: for a sudden fall would endanger the result of the operation."

Agricultural Chemistry.

BY HENRY R. MADDEN, ESQ. L. R. C. S. EDINBURGH.

[*From the Edinburgh Quarterly Journal of Agriculture.*]

2. *Inorganic or Mineral Manures.*—In our last we completed a short sketch of the composition of the animal, vegetable, and vegeto-animal manures which compose our division of organic manures: we shall, therefore, at once proceed to make a similar examination of those substances belonging to the mineral kingdom, which farmers are in the habit of employing for the purpose of enriching their land.

We have before remarked, that these substances act in a manner totally distinct from organic manures, the reason of which is obvious, because they *cannot* be, from their nature capable of supplying either of the four elements, viz: *carbon, oxygen, hydrogen* or *nitrogen*, which, as we have so repeatedly stated, form the essential constituents of all plants; we must therefore look to other circumstances besides the mere nutrition of vegetables, in order to explain the true cause of those beneficial effects which, beyond doubt, result from their judicious employment.

The advantages to be gained by the use of mineral manures may obviously be either direct or indirect, according to the effect which they produce; for example, those substances which either alter the texture of the soil, or more especially such as supply saline matter to the plants themselves, may be said to be directly beneficial; whereas those which merely act as chemical agents in hastening the decomposition of the organic matter existing in the soil, can be said to be benefiting the plant in an *indirect* manner only. It will be impossible, however, to form any subdivision of this class of manures, upon the above fact, as many of them act in both ways, and moreover, the whole subject is as yet involved in so much doubt, that we should well deserve the imputation of rashness, were we to attempt any classification of these substances founded upon their mode of action. The more important purely mineral manures are *lime, its carbonate, or chalk, its sulphate or gypsum, marl, saltpetre, common salt, and kelp.*

Lime.—This is undoubtedly the most important of this class of manures, from which circumstance alone it well deserves to rank first in the list. Like all great benefits it has been most shamefully *abused*, but I think that it will be by no means difficult to prove that the fault lies entirely with the farmer who unfortunately is far too apt to follow example blindly, in place of really examining the *principle* upon which the *practice* is *founded*, and without which success is always precarious, and often absolutely impossible. In the subsequent remarks which we propose to make upon this class of manures, it will be necessary to enter much more fully into practical details than we have hitherto done, as the whole success or failure of these manures may be said to depend almost entirely upon their mode of application, and I may here premise that many of the *practical observations* which I shall have to make, are derived from the excellent, but now rare, pamphlet on manures by the justly celebrated Arthur Young.

The action of lime upon soil differs entirely according to the state in which it is used, namely, in the form of *true lime*, *hot lime*, or in the state of *mild lime*, as it is termed, in assuming which condition it has undergone some most important chemical changes which we shall mention presently.

The *chemical* properties of lime, and its *chemical* action upon organic matter, must, in the first instance, occupy our attention, in order that the subsequent remarks upon its use as a manure may be clear and intelligible. Lime is ranked by chemists among the *alkaline earths*, by which term is meant those earthy substances which exhibit characters similar in many respects to the true caustic alkalies, *potass, soda, &c.* it is always prepared by heating its native carbonate or limestone, to a temperature sufficiently high to drive off all the carbonic acid and water which it contains; so that were limestone composed of nothing else but *carbonate of lime* and water, pure lime alone would be left after burning; this, however, is never the case, as other substances, especially alumina, silica, iron, and often magnesia, occur mixed with the lime, but in good specimens these should be in very small quantities, as of course, I need hardly say that their presence diminishes the value of the specimen in direct proportion to their quantity. On this account, the proportion of lime contained in any new specimen of limestone should be accurately determined before applying it to agricultural purposes, more especially if there should be any reason for suspecting the presence of magnesia which we have so repeatedly said is injurious to vegetation, particularly in its caustic state. On this account we shall here give a few directions for the examination of limestone, which we trust will not be considered out of place. Let us suppose that the experimenter is not desirous of ascertaining the exact constitution of the limestone which he is about to examine, but merely wishes to discover whether it contains any considerable quantity of magnesia, alumina, or iron.

1. Let him take a small quantity of the sample to be analyzed, say 100 grains, and dissolve it in one ounce of strong muriatic acid (spirit of salt) mixed previously with about 2 ounces of pure water; when the effervescence (owing to the escape of carbonic acid) has entirely ceased, if any thing is left undissolved it must be separated from the solution, by filtration through white blotting paper, and the insoluble matter when dried and weighed may be noted down as *silica*.

2. The operator must next add to the filtered fluid successive portions of *strong ammonia (hartshorn)* until the liquid smells of this substance; any thing which is thrown down during this operation must be likewise separated by filtration; this will consist of *alumina* and *iron*, the proportion of the latter being judged by the darkness of the colour (*pure alumina* being white.)

3. The next step is to add to the fluid a solution of *oxalate of ammonia* (this should be prepared by a druggist) as long as any precipitate appears; this is the lime in combination with the oxalic acid.

4. Lastly, having again filtered the solution, add a small quantity of *carbonate of soda* (common soda) dissolved in water; if the former parts of the process have been performed carefully, no precipitate whatever will now appear, unless *magnesia* is present, so that the quantity of this substance may be judged by the proportion of this precipitate.

Difficult as this process may appear to those who have never performed any chemical analysis, still a very little practice will make it quite familiar, and it is the only method by which the presence of magnesia can be detected with unvarying certainty; at least without making use of chemical tests, which cannot be easily purchased, and are very troublesome to prepare. Should any one wish to render himself expert at the above operation, I should recommend his taking some specimens of limestone, and repeating the process several times, until he arrives at the same results by each experiment. If the quantity of lime is wished, the precipitate of No. 3 must be carefully collected, dried, and weighed; and then, every 100 grains will denote 34 grains of pure lime, or 61 grains of carbonate of lime in the original specimen.

Whenever lime, in its pure or *hot* state, is exposed to the air, it has a very great tendency to return to the original form of carbonate; in undergoing which change, it first absorbs a large quantity of water; and then assumes the form of slaked lime, or, according to chemical nomenclature, has become a *hydrate*; this hydrate, in its turn, rapidly absorbs carbonic acid from the air, and thus, in no long period, the burnt lime returns to its original condition, with the only difference, that whereas it was formerly in large stony masses, it is now in the state of a fine powder. When the lime is completely slaked, and *partially* carbonated, it forms the substance termed *mild* lime, by farmers.

Of these three conditions of lime, namely, the *hot*, the *mild*, and the true *carbonate*, the first is possessed of by far the most energetic powers. The true carbonate of lime, in fact, differs completely in its action from the others. We must, therefore, of necessity, treat of each separately.

Hot Lime.—When any organic matter is mixed with hot lime, it undergoes putrefaction with much greater rapidity than when left to itself. The exact cause of this is not well known; but the immediate *changes* which the various substances undergo, especially in the case of vegetable matter, have been pretty accurately examined. Thus, for example, it has been proved *first*, that *woody fibre, gum, sugar*, and many other vegetable matters, are converted into *humic acid*, with more or less rapidity, when kept in contact with hot lime, or any other chemical substance which possesses strong alkaline properties. *Secondly*, that this *humic acid*, when formed, unites with the lime, and generates a compound which is not very soluble in water, but is easily diffused through it. And, *lastly*, it has been proved, that a very little lime is required to produce this compound, with a large quantity of humic acid. For example, 23 grains of pure lime are capable of combining with no less than 318½ grains of this acid; so that the lime in this compound amounts to little more than eight per cent.

To apply these facts, therefore, we may remark, that there is very little doubt, that changes similar to those above mentioned take place, when hot lime is applied to soil; or, still more so in the case of lime composts. At the same time, it is exceedingly probable, that during the production of *humate of lime** (the compound of lime and humic acid above mentioned,) other compounds are formed, many of which are very possibly soluble in water; at least if we may judge by the appearance presented by vegetable matter, after it has been long exposed to the action of this or any other alkaline matter. From these remarks it would appear, that the most important object to be gained by the application of hot lime, is the decomposition of *woody fibre*, and the consequent formation of *humate of lime*, and various soluble matters.

Mild lime does not act by any means so powerfully as the preceding compound; in fact, it appears to have no effect whatever upon woody fibre. On the other hand, however, it is capable of uniting with the humic acid existing in the soil, precisely in the same manner as hot lime; on which account, Sir Humphrey Davy remarks, that mild lime is useful in preventing the too rapid decomposition of substances already dissolved; the truth of which is evident, when we call to mind the well established fact, namely, that organic substances, which of themselves are extremely liable to decomposition, may be rendered much more permanent, nay, often perfectly so, by entering into *chemical combination* with any *inorganic substance*. Pure carbonate of lime will be treated of under the head of chalk.

So much for the pure chemistry of this most important manure. We must, however, now proceed to what the majority of our readers will consider as by far the most interesting part of the subject, namely, the practical deductions to be drawn from the above remarks; or, in other words, the manner in which practice is to be guided by the principles above laid down.

First.—It is perfectly clear, that *hot lime* will be useful in all cases where there is an excess of undecomposed vegetable fibre, as in peat-soils, moors, heaths, &c. in fact, in all places where the natural growth has not been interfered with for a great number of years; from which it follows, that hot lime will be a peculiarly useful application to old grass, which has lost heart from age, particularly if it is, at the same time, broken up for tillage.

Secondly.—Sir Humphrey Davy has proved, that hot lime, whether solid or dissolved, is injurious to growing plants.—For example, he states, that he has frequently killed grass by watering it with lime water. From this fact, therefore, it follows, that *hot lime* must be an extremely useful application, when it is desired to free land of its spontaneous growth; as for instance, in places overgrown with weeds.

Thirdly.—Hot lime is extremely useful in purifying (if we may be allowed the expression) the original herbage of moors, and other *uncultivated* grounds. The mode in which this is effected being somewhat interesting, we shall here say a few words upon the subject. It is generally allowed, that the finer grasses, &c. require richer food than those which are less valuable; and also, that the same remark holds good, the lower we descend in the scale of vegetables: namely, that the lower the plant is, the more easily it is nourished by the contents of the *atmosphere;* and hence the less dependent it is upon the soil for its subsistence; the consequence of which is, that when, in the lapse of time, the soil of any spot becomes more and more exhausted, the most valuable and important grasses gradually die away, from the want of sufficient nourishment, and give place to those diminutive species, which so frequently constitute the herbage of the almost barren moors; these again, if moisture be present, give place, in their turn, to various mosses, &c. so that at last, unless the improving hand of man steps in to avert the doom, the spot will return to a state unfit for the support of any living plant, with the exception of those which derive most, if not all, their nourishment from the surrounding air. Should it be otherwise, how different the result! For instance, should *hot lime* be applied, from the looseness of their texture, this destroyer first attacks the mosses and all other useless plants, and thus converts them into useful manure, which, by being washed into the soil by genial showers, revives the seeds of those plants which grew there ages previously, and, in a comparatively short time, the lately unprofitable waste glows with the return of its pristine verdure. How beautifully many of my readers must have seen this exemplified, in the crops of white clover which so frequently appear, almost like magic, after the liming of some barren moor!

Fourthly.—*Mild lime* is a most useful application in all cases, where any of the above circumstances occur in *cultivated land.* For instance, if the lime is comparatively fresh, it is much safer to employ it in the mild form, when we desire to destroy weeds or other injurious plants, growing upon richly manured lands, which, from carelessness or other such cause, have been allowed to become foul; for, were the lime, in this instance, applied in its *caustic state*, although it would unquestionably kill the weeds, still, their destruction would be accompanied with a great unnecessary loss of manure.

Fifthly.—It sometimes occurs, more particularly in garden ground, that the crops become rank, from the existence of a superabundance of soluble manure, the evil effects of which can almost always be counteracted by a dressing of *mild lime*, which, by combining with the humic acid, renders a large quantity of the organic matter much less prone to decomposition, and likewise, at the same time, less soluble; *humate of lime*, as before remarked, being by no means very soluble in water. It may very probably be asked here, how can it be advantageous to apply lime in any case to soil, since it tends to render *soluble* matters *insoluble*, when it has all along been stated that the very reverse is the proper mode of preparing the food for plants? An answer to this question must, therefore, of course, be requisite. It must be observed, in the first place, that we have already stated that lime is useful chiefly in those cases where the organic matter is *insoluble*, because it causes the formation of *humate of lime* and different *soluble* matters; all we have to account for therefore is, how humate of lime comes to be a useful manure? It may be remembered that I stated in No. 2, of this series,* that humic acid was of itself "quite *insoluble* in water:" from the result, however, of some experiments published since that number was written, it appears that this statement is not strictly correct, for humic acid is *soluble* in water (more especially when newly formed) except under particular circumstances, so that it is extremely probable that the humic acid derived from the slow decomposition of humate of lime, will, at the moment of its liberation, be capable of dissolving in water, and thus of course become a useful manure. We shall now conclude our remarks upon lime with a few important cautions to be attended to in its application.

Mr. Arthur Young remarks, that the best directions for applying lime are those given by Mr. Craike of Arbigland, who advises, that the whole quantity of lime that the farmer intends to apply to any field of moderate size, should be carted out, and laid together in a heap, at some spot where water can be obtained with the greatest facility. The whole is next to be thoroughly slaked; and *immediately* after it has cooled, which will take place in a day or two, the lime is to be recarted and spread over the surface of the land as equally as possible. Mr. Craike further remarks, that the more common method of laying down the lime in small heaps all over the field, and allowing it to slake by rain, is *very erroneous;* for in this instance it is very liable to get too much rain, which, in place of merely slaking it, and thus reducing it to a fine powder, converts it into "running mortar," in which condition "it will neither spread easily, nor mix with the soil." On the same principle Mr. Wight observes, that both the lime and the soil should be perfectly dry at the time of application. The truth of these remarks could have been predicted by scientific examination alone, and it is at all times pleasing to discover that the *results* of successful practice directly correspond with the *indications* of true theory. For example, there are many scientific objections to be made to the plan of laying the lime in small heaps all over the field in order to be slaked by the rain, in addition to the evident one, mentioned by Mr. Craike, namely, the formation of "running mortar." These are, 1st, that it exposes a far greater surface for the absorption of carbonic acid, which, as is evident from the remarks already made upon this subject, diminishes materially the effect of the lime. 2d, It must necessarily be exposed for a much greater length of time, and consequently will most probably be entirely converted into *carbonate of lime;* or it must be spread upon the land during wet weather, which will of course render it far more difficult to incorporate properly with the soil. And lastly, its being slaked by rain-water is directly injurious, as it has been proved that there is a greater quantity of carbonic acid present in the air, during dull than in bright weather, which gas will of course be absorbed by the rain, and thus carried to the lime, so as to increase still more the chances of its becoming carbonated. On the other hand, however, it is evident that all these objections may be obviated by adopting the simple, and if we look to the result, the much more economical method proposed by Mr. Craike.

As to the period at which the lime should be applied, this must depend so much upon peculiar circumstances affecting each farmer differently, as convenience, leisure, &c. that it is impossible to fix the time so as to suit all persons. When, however, a choice can be made, summer is by far the best season according to Mr. Young, the reason of which is obviously because it is the driest period of the year, and likewise, when hot lime is used to destroy weeds, they are generally in their greatest vigor at that time, and consequently are capable of being destroyed more effectually.

The quantity of lime to be used is likewise a subject of considerable importance, but nevertheless is one which is apt to be far too much neglected; upon this subject Mr. A. Young is most explicit. "In common cases," says he, "the quantity should be guided by a *chemical analysis of the soil;*" and, beyond doubt, this is the only sure way of applying it with success. What, for instance, can be more absurd, than for a farmer to go on applying lime to his land, time after time, when perhaps his soil is already loaded with calcareous matter? It is a well established fact, that an excess of any of the earthy ingredients of soil exerts a most important influence over the plants which grow there: this is remarkably the case with the natural productions of all soils. To such an extent, in fact, does this hold true, that a good botanist will tell with great accuracy the chemical nature of the soil, by the plants which he finds growing upon it. If this, therefore, takes place naturally, where seeds of all kinds must be constantly deposited on every species of soil; if, I repeat, *nature* thus arranges the plants according to the constitution of the soil, shall we deny that they have any effect upon cultivated plants? Shall we presume to say that we can grow all kinds of plants equally upon every variety of soil? most assuredly not. How, then, can that farmer expect to be successful, who, by constantly adding lime to soil already *calcareous*, at length increases this substance to such a degree that it is unfit for the support of any plants, except those which naturally prefer a soil of this description? That the above statement is not a mere *theoretical* objection, is most distinctly proved by many facts. Who, for example, does not know that wheat is an unprofitable crop upon light soils? Or, again, who would attempt to cultivate turnips upon strong clay? *Chemical analysis*, likewise, of the plants themselves, prove most distinctly the influence which the earthy constituents of soil exert over the saline composition of the ashes of these plants. Thus M. Saussure found, that 100 parts of the ashes of common fir contained 43 parts of carbonate of lime when grown on a limestone hill, whereas the same quantity contained only 29 parts when grown on granite; and again, the ashes of the leaves of the *Rhododendron ferrugineum* grown upon limestone contained 43¼ per cent of chalk, whereas it yielded 16¾ per cent only of that substance when cultivated upon a granite soil. There can be no doubt, moreover, that the proportion of the different constituents of the ashes of plants have the greatest influence upon the vigor and productiveness of the plant itself, and I have no hesitation in saying that the culture of plants (more especially the *garden culture of exotics*) will never be brought to any thing like perfection until they have each and all been submitted to *chemical* examination; the proportion of all their saline constituents accurately determined; and the nature of the soil for each chosen upon these grounds. I leave it to those interested in such matters to decide, whether it would not be worth their while to take the requisite steps for the accomplishment of such an undertaking.

On the other hand, however, a very large quantity of calcareous matter may naturally exist in soil, without rendering it unfit for the purposes of cultivation; for instance, it is stated by Mr. Cuthbert Johnson, in the "British Farmers' Magazine" for April 1837, that "the richest soils, on the banks of the Parnel, in Somersetshire, contain more than seventy per cent of chalk!" But we are all well aware that there are many peculiarities in the cropping of calcareous

* I have continued to denominate this acid, humic acid, although I find that, latterly, especially in chemical works, the term *ulmic acid* has been substituted for it. I trust, however, that this will cause no confusion, as the difference is in the name only.

* No. XLII. p. 241.

soils which must be attended to in order to insure success. Almost all soils, however, contain more or less of this substance, and it is remarked by Professor Low, that it "generally, though not always, exists in larger quantities in the better, than in the inferior soils." None of these remarks, nevertheless, by any means favor the employment of lime upon calcareous soil, in addition to which the plea of not being able to succeed without it, will be shewn to be untenable, when we are treating of the "Economy of Manure;" consequently we may rest assured that Mr. Young's remark is perfectly true, namely, that the quantity of lime must be judged by a *chemical analysis* of the soil.

Lastly, the farmer must always bear in mind that neither hot nor mild lime can act as a manure until it has become converted into *carbonate* or *humate*, and consequently that the fertilizing effect of these substances are produced *at the expense of the organic matter previously existing in the soil;* so that although lime is directly useful by calling into activity otherwise inert matter, nevertheless it undoubtedly *exhausts* the soil by so doing, and this of course should make the farmer cautious about repeating it too frequently; and he must be particularly careful lest he mistake the dimunition of the productive power of soil, caused by the too frequent application of lime, for a proof that more lime is required, as in this way there is no doubt that many agriculturists have as it were *poisoned* their fields, by the very means by which they had hoped to effect a cure. The two apparently opposite effects of lime must also be born in mind, namely, that although it *increases* the solubility of *inert* vegetable matter, still it renders much *less soluble* those parts of the organic constituents of soil which have already become capable of solution.

Carbonate of Lime or Chalk.—This differs from limestone merely in its being of a much softer texture, and hence capable of being broken down with greater facility. In its action it differs entirely from the last substance; thus it has no effect whatever upon inert vegetable fibre, and I should very much doubt whether it is in all cases capable of uniting with humic acid, so as to render the soluble parts of the manure less prone to decomposition. Its action, however, is nevertheless most beneficial; for example; it tends greatly to alter the texture of the soil to which it is applied, and possesses likewise the very useful property of being retentive of water, without at the same time becoming adhesive; consequently, it can be used with the greatest advantage both to clays and sands, under certain circumstances. If, for example, you wish to open the texture of a clay, and render it more friable, but at the same time are not desirous of diminishing to any considerable extent its retentive powers, you cannot do better than apply chalk; and again, if you are anxious to increase the absorbent power of a sand without at the same time adding to its tenacity, a good dressing of chalk will in most cases produce the desired effect. The advantages of chalk as a top dressing to meadows is far too well known to require any notice here. It is, however, by no means easy to understand its mode of action, except there were an actual want of that substance in the land previous to its application; in which case, of course, the good effects could be explained upon the principle adhered to throughout all these observations upon Agricultural Chemistry, namely, that we can never expect to be successful in the cultivation of any plant, unless we supply it with all the ingredients, whether *organic* or *mineral*, which it contains when growing in a state of nature, upon a soil of its own choosing, if we may so express it; the importance of which remark, in reference to chalk, will at once appear, when it is considered that scarcely a plant exists which does not contain more or less of this substance. As the total want of chalk, however, is a very rare occurrence in soil, we must look to other modes of action, in order to explain the frequent beneficial effects which result from top-dressing grass with this substance; and I may here premise, that this subject is one upon which extremely little is known at present, and consequently we can do little more than make a few conjectures regarding the various possible modes of action; these, nevertheless, may be of use in directing the attention of those who should wish to examine the subject to certain points which they might otherwise be apt to overlook.

It will be remembered, that, in enumerating the various constituents of soil, in the first number of this series, I had occasion to mention iron as a constant ingredient of soil, although I at the same time observed that it seldom occurred in any considerable quantity in fertile soils. All my agricultural readers must be well acquainted with the fact, that, when this substance, by any means, becomes soluble in water, it is most prejudicial to vegetation of all kinds. Now, it is extremely probable that this fact will be found of great consequence in explaining some cases, at least, in which the beneficial effects of chalk have been observed. There is no practice more common (and I by no means wish to censure it) than the top-dressing of old pasture-land with farm-yard dung at the interval of a certain number of years; but all animal matters contain more or less sulphur, so that whenever these substances undergo decomposition, *sulphuretted hydrogen* is always one of the products. Now, it is well known to chemists that when *sulphuretted hydrogen* and *oxide of iron* (the form in which iron exists in the soil) come into contact, a mutual decomposition takes place, and there results *water*, and *sulphuret* of *iron*. This compound, however, is of itself *insoluble*, so that were no further change to take place, no harm whatever would accrue from this chemical combination; but unfortunately this is not the case, for the *sulphuret of iron*, by exposure to air, gradually undergoes an entire change, and is at length converted into a very soluble substance, namely, *sulphate of iron, or common copperas, or green vitriol* as it is termed. In this manner, we perceive that, in the progress of time, the application of farm-yard dung or any other *animal* manures to soils rich in iron, renders this substance *soluble*, in which state, as before mentioned, it is exceedingly prejudicial to vegetables. How, then, is this to be remedied? or how is it that this does not always take place? In soils rich in calcareous matter, although the change does take place, it is of no consequence whatever, for as soon as the *soluble* sulphate of iron is formed, it is acted upon by the carbonate of lime, and the results are *sulphate of lime* or *gypsum*, and *oxide of iron*, or in other words the iron is restored to its original *inoffensive* state; but where there is not sufficient lime in the soil, as for instance, where there is a large quantity of iron, this substance must be added; the form of chalk being of course preferable, as in this case no action upon the vegetable fibre of the soil will be required. When such intricate and important chemical changes are constantly going on in the soil, and when it is considered that, unless the remedy is at hand, the very *food* given to the plants carries *poison* with it, and consequently, that unless checked by proper means many valuable pastures would be rendered useless. Who will deny the importance of *chemistry* to the farmer? or who will dare to say that practice *alone* acts more *certainly*, though more slowly than when aided by *science?* Surely it must be evident to every thinking mind, that the practice of agriculture would be upon a much surer basis, were all its votaries acquainted with the principles upon which their art was founded. And if so, why is there such an apathy evinced by the supporters of this all-important art to the advancement and cultivation of *its science?* To be sure, a slight stir of late has been made among some of the leading societies connected with agriculture, but with what effect *who can tell?* and the reason of this is obvious,—the majority of the agricultural population are by no means devoted to reading, and consequently, though all the agricultural societies in Great Britain were to publish upon the subject, it would be long ere the farmers became acquainted with the fact. To do good they must have the advantages of the science *laid before them practically*, and this can be done only by the establishment of experimental farms under the direct superintendence of both a *practical* and a *scientific* farmer; or by the formation of agricultural schools, in which the youth intended to follow such pursuits shall be properly instructed in the principles which should guide them in the prosecution of their business. That some such decided step will be immediately taken by those capable of rendering its success a comparative certainty, is the most ardent wish of the author of these papers.

Marl.—This substance naturally comes under our consideration here, as it is generally allowed that marls are valuable in direct proportion to the quantity of calcareous matter which they contain. The marls most common in England are the clay, stone and shell marls; they are in general composed, similar to soil, of silica, alumina, carbonate of lime, and frequently oxide of iron, so that, in fact, they might be compared to calcareous soils. The carbonate of lime varies from 20 to 80 per cent. One of the best clay marls quoted by Arthur Young was composed of carbonate of lime 40 per cent, alumina 40, silica 8 or 10, and a distinct trace of iron. The action of this substance is, of course, in the main similar to chalk, but the clay marls are likewise very beneficial in giving tenacity to loose sands. There are two or three points to be borne in mind with reference to the application of this substance, which we shall here mention.

First, And this is of great importance, marls are often very injurious when applied to the soil immediately after they are dug; whereas this effect is completely prevented by allowing them to remain exposed to the air for a certain length of time, as, for example, by placing them in a heap and turning it frequently. I have never been able to find any attempt to explain this very curious fact, and I candidly confess that I do not know how to account for it. The fact, however, is universally acknowledged, and that the only probable plan of discovering the cause of the injurious effect would be to subject specimens, wherein the evil was known to exist, to careful chemical analysis, and. in this manner, discover in what particular they differ from others which do not possess this injurious property. An investigation of this sort is, however, far too delicate to be performed by any person who does not possess a thorough knowledge of chemistry, and I should therefore recommend the proprietors of marl-pits of this description to employ a professional person to discover the cause of the injury, as in all probability such discovery would point out some means of cure, which would require much less time and trouble,—those invaluable commodities,—than the process by exposure above referred to.

Secondly, The farmer must always bear in mind that marl acts merely on account of the carbonate of lime it contains, unless it is added for the express purpose of altering the texture of the soil, as, for example, when applied to very light sands, in which case it will act beneficially, even although the land should not be in actual want of calcareous matter. In this instance, however, pure clay would answer as well, and be more advantageous, inasmuch as the whole quantity carried will be of value, whereas if marl were used, about one-third of the quantity would consist of chalk, which, in this instance, would be of no value. On the other hand, marl is of course far inferior to chalk or lime for clay land; this fact seems well known to farmers, as will be seen by the following rhymes, which occur in a paper upon peat, published by the Rev. Dr. Walker in the Transactions of the Highland Society for 1803. In speaking of the application of marl as a manure, he observes that the Lancashire farmer says,

"If you marl *sand* you may buy *land*,
"If you marl *moss* you shall have no *moss*,
"If you marl *clay* you *throw away all*."

Lastly, When marl, or any other substance dug from below the surface of the ground, and used in large quantities, is applied, the farmer must always recollect that surface-soil alone contains organic matter, and that fresh subsoil has the power of combining *chemically* with a considerable quantity of soluble manure, and rendering it much less decomposable, so that, unless the soil is rich in manure at the time of application, the farmer must not expect to see any marked improvement immediately after he has applied the marl; nor should he condemn the practice even although the first crop should be somewhat inferior to those before the marl was used.

Gypsum, or sulphate of lime. This substance more properly belongs to a class of manures, which are at present very little known among farmers, but which I trust will soon attract that degree of attention that they undoubtedly merit; I mean those which the ingenious Mr. Grisenthwaite denominates *specific manures*, by which term is implied, that the substance in question does not act as organic manure, by supplying organized matter to the plant, nor as many mineral ones, by acting chemically upon the vegetable fibre of the soil; but owe their beneficial effects to their power of supplying the plants with certain *saline combinations* which are essential to their perfection, and are for the most part peculiar to the plant itself, or, in other words, belong to a few plants only. Upon this very interesting topic we have frequently had occasion to throw out a few hints, but have not hitherto made any express remarks, as we considered that they would be much more suited for this place. The subject being almost entirely new, is at present in a very imperfect state, and the subsequent remarks will serve merely to direct the farmer's attention to the point, and I sincerely hope they may be the means of inducing some one to follow out the work in the only way in which it can be achieved, namely, by *chemical analysis*.

It has been proved by chemical analysis, that many plants, probably all, contain some saline substance peculiar to themselves, and consequently of great importance to the wellfare of the plant. These salts are frequently of a kind which by no means constantly occur in soil, as for example, *phosphate of lime, sulphate of lime, nitrate of potass, &c.* and, of course, the plants which require these cannot be expected to thrive under such circumstances, unless they are supplied artificially with the required substance. It comes, therefore, to be a point of the greatest consequence to the farmer, that a very careful analysis should be made of all the cultivated plants, in order that the exact constitution of the saline matter should be ascertained, and in this manner the farmer will be enabled, in many instances, to grow plants in situations which probably could never before be made to bear them profitably. For example, to apply this remark to the specific manure now under consideration. *Gypsum* has been the subject of several experiments, in order to ascertain its value as a manure, the results of which prove that it is often useful for *grasses*, aud always valuable for *clover, saintfoin, lucern*, and analogous leguminous plants. Now these are the very plants whose saline matter contains abundance of sulphate of lime. Sir Humphrey Davy's remarks upon this subject are truly valuable. He says, for example, that most grasses, especially *meadow fox-tail, cocksfoot* and *fiorin*, contain gypsum; and he observes that the application of this manure would probably be of great value in restoring lands which have been exhausted by frequent *clover crops* and the like. The reason why this substance is not constantly required is, that most soils contain a little of it, but more especially because *all animal manures* have a certain proportion of this substance, and therefore, cultivated land seldom requires any to be added to it. On the other hand, however, it is well known that there are few crops so uncertain as the clover crop, and consequently it would be of great importance to ascertain how far this failure may depend upon the want of sulphate of lime, as, of course, that could be prevented with the greatest ease. There is one point to be attended to with reference to the use of gypsum, namely, that is is apt to fail in some cases where a farmer would least expect it, namely, in soils rich with *animal manures;* chemically, however, this is just what we should have been led to expect; because, during the decomposition of animal matters, *carbonate of ammonia* is produced, which reacts upon the *sulphate of lime*, and produces sulphate of ammonia and carbonate of lime, neither of which are capable of supplying the place of gypsum as a *specific manure*. It is stated that gypsum is particularly useful when it is intended to cut the crops green, as it makes the plants renew their shoots much more vigorously than they otherwise do.

Annual Address,

Before the Kentucky State Agricultural Society—delivered at the Capitol in Frankfort, January 14, 1839, *on the dignity of the profession of agriculture, and the propriety of legislation for its improvement.*

BY COL. C. S. TODD, OF SHELBY.

(Concluded.)

Agriculture constitutes the business of seven-eights of every civilized community, and is the ultimate source of all national power and wealth, commerce and manufactures being only subordinate results of this main spring. If it be conceded that it is the duty of the legislator to consult the good of the greatest possible number in the community, the transcendant claims of this class will not be questioned; and taking for granted that the condition of our agriculture admits of improvement, and that such improvement will lead to the receipt of greater revenue, there will be no difficulty in obtaining an assent to the proposition that the state is bound to elevate the standard of good farming. This high object has been effected in some of our sister states and in some portions of Europe, by the endowment of agricultural societies of Europe, by the endowment of agricultural societies and of agricultural professorships in colleges, to induce experiments and impart scientific knowledge in all the branches of farming. These measures have been adopted with the happiest results—those who originated them having concurred in the opinion of Sir John Herschel, the great astronomer, that "the arts cannot be perfected till their whole processes are laid open: they are the application of knowledge to a practical end; if this knowledge be experience, reasoned upon and brought under general principles, it is *scientific art*."

The advances made in agriculture by the Romans, so beautifully illustrated by their poets and orators, shared the fate of other improvements that were buried in the dark ages, and it was not until after the revival of letters that the present system of farming commenced in Flanders about 800 years ago; and although the soil was originally a barren white sand, it now yields twice as much as the lands in England. The practicability of *creating* soil is shown in the history of Flemish husbandry. They seem to want nothing but a space to work on, whatever was the quantity or the quality of the soil, they made it productive. It is their maxim, that "without manure there is no corn—without cattle there is no manure—and without grain crops or roots, cattle cannot be kept." The productiveness of their lands proceeded from six causes—small farms, manure, rotation of crops, clover and roots, cutting the forage and grinding the grain—and the farmers giving their personal attention to their farms: no lumbering, no fishing, no speculation, no hankering after office. If the personal digression be pardonable, I will refer in connexion with this subject, to an incident which occurred in my own history when entering upon the cultivation of the soil. In conversing with an experienced farmer, I was led to inquire as to the best mode of making corn. He told me that I must *keep my work horses fat*. I did not then perceive the comprehensive character of his counsel, but have long since realized that it implies every thing connected with good cultivation, although neither he nor I then knew that Cato, one of the most illustrious of the Romans, 2000 years ago, had announced that "the true secret of farming consists in *feeding well*."

The great Von Thaer first introduced into Prussia, under the auspices of the sagacious Frederic, the agricultural schools,

which "connected the science with the practice of agriculture—which made gentlemen farmers, and farmers gentlemen—combining intellectual with physical power, and literature with labor." Frederic expended a million annually for these purposes, and said he considered it as *manure spread upon the ground*. In Paris a society has been formed which communicates with more than 200 local societies in France, receiving annually $100,000 from the public treasury. Agricultural colleges have been established at St. Petersburgh and Moscow, in Prussia, Bavaria, Hungary, Wurtemburg, Ireland, France, and in Scotland, who effected her late astonishing improvements by her skilful agriculturists reducing their practice to writing, thus establishing agriculture as a science. Fellenburg has a school in Switzerland with pupils from Switzerland, Germany, France, Spain, Portugal, North and South America. The Highland society in Scotland has appropriated 500 sovereigns as a premium for the first successful application of steam-power to the cultivation of the soil, and premiums for other objects to the amount of $15,000. The agricultural condition both of England and Scotland, has been advanced to its present prosperity by the lights of science applied to the cultivation of the soils. The tour of Sir Arthur Young, to the continent in 1788–9, for the purpose of looking into the countries there under the best system of farming, produced the first decided advances in England to her present agricultural maturity and the perfection to which the art has been brought in Scotland, is ascribed chiefly to the endowment of an agricultural Board, through the influence and exertions of Sir John Sinclair.

Agricultural societies are not now to be regarded as experiments: they are the peculiar privileges of modern times. Before they were formed, in New-England and New-York, 10 bushels of rye, 20 of corn, 200 of potatoes and one ton of hay, was the average crop. Since premiums were offered, claims have been presented for having raised from 40 to 50 bushels of rye, from 115 to 122 or corn, from 400 to 500 of potatoes and from 3 to 4 tons of hay. Massachusetts gives a bounty equal to the cost of manufacture upon the growth of silk, and upon manufacturing beets into sugar. After experiencing the benefit of a former appropriation she has voted to continue it. Maine, Vermont, Connecticut, New-Jersey and Pennsylvania have also granted a bounty upon the growth of silk. Will these examples and these results be lost upon us? Will not the State as well as our farmers profit by the experience acquired in other States of the value derived from legislative encouragement, and ought not an agricultural survey to follow the geological reconnoissance now in progress, which will develop the intimate relation between the minerals that the earth covers and the true method of cultivating its surface?

An improved state of husbandry in Kentucky, and the system of improved roads and navigation, will act with reciprocal benefit upon each other; the roads and rivers will enhance the price of agricultural products by the greater facilities afforded in conveying them to market, and thus increase the revenue from tolls; while the increase in the products of the soil will not only add to the tolls but will furnish an increased revenue, both from the value of the increased products and the increased value of the lands. For the want of any accurate statistical tables shewing the agricultural product of the whole State, it is impossible even to approximate to a correct estimate, but it is palpably evident that 10 per cent upon the amount would yield a large revenue, and will any sensible farmer doubt that our modes of cultivation may not be improved so as to add 20 or 50 per cent to the wealth of the State? And if, according to Pliny, Egypt with only 6000 square miles, at one time contained a population of 20,000,000 by reason of the immense fertility superinduced by the government leading canals from the Nile, what may not be the future destiny of Kentucky, with more than six times the territory, when her resources shall be developed and invigorated by the same beneficent policy? Of the value of canals, or slack water navigation, which is more beneficial, upon the agricultural interests of a country, a striking illustration is given by Count Chaptal, a Peer of France, distinguished for his attainments in agricultural chemistry and his experience as a practical farmer, who traversing a barren part of Flanders, accompanying Napoleon, the latter expressed his surprise at a meeting of the council of the department, that so great a tract of land remained uncultivated in so illustrious a nation. The answer was, "If your Majesty will order a canal to be made through this district, we pledge ourselves that in five years it will all be converted into fertile fields." The canal was ordered to be made without delay, and in less time than they promised, "not an unproductive spot remained." This was effected by means of the easy transportation upon the canal, of the manure from the rich districts.

The chief magistrate, alluding in his last annual message to the deep interest which the State ought to cherish in the cause of internal improvement, uses the emphatic language that "Kentucky cannot stand still." A noble sentiment! worthy indeed of a patriot, and which may be illustrated by reference to many pround periods in the history of the State. The soldiers of the revolution, who were the pioneers in planting the standard of liberty, law and civilization on this once "dark and bloody ground," rescuing it from the savage and from the forest, "did not stand still." In the second war for independence waged in defence of commercial interests and of sailor's rights, of which she was not personally the victim, Kentucky "did not stand still;" her valor and her patriotism having signalized every field of blood from the shores of the lakes to the banks of the Mississippi.—"Kentucky did not stand still" in the cause of human freedom, whether she supposed that standard was unfurled among the children of the sun in the south, or on the classic shores of Greece; and now in this age of improvement, she stands ready to take her place among her enlightened sisters of the confederacy, by entering upon a noble career in reference to the high interest which the Governor elucidates with so much ability. But may we not hope that if the day has not already dawned, it is rapidly approaching, when she "will not stand still" in efforts to advance the great cause of agriculture? All the motives which may be sudposed to have influence in causing her march to be "*onward*" in relation to the cause of internal improvements, apply with equal force to the encouragement of her agricultural interests; for if the appropriation of seven millions of dollars to the construction of paved rail-roads and slack water navigation, be justly predicated on the assumption that it will increase the wealth and consequently the revenue of the State, there can be no conceivable reason why an improved condition of agriculture, superinduced by the application of science to art, shall not demand of the legislative councils some display of the public bounty. The selfish as well as the more elevated motives which ought to prompt the farmer to adopt such methods and to seek such information as science imparts to the cultivation of the soil, whereby an increased profit may attend his labors, address themselves with undiminished force to the legislative councils; for if, as in the case of Scotland and the New-England States, the endowment of agricultural societies and professors, and the authorizing of agricultural surveys, should lead to a *fourfold* increase in the productions of the soil, the bounty granted by the state would be more than repaid in an increased revenue. But this subject is too transcendent in its beneficial influences, to be estimated merely by the dollars it would yield to the treasury of the state or of individuals. An improved condition of agriculture carries with it a train of blessings which money cannot purchase, in an increased intelligence and a higher toned morality in the mass of the people. In proportion as science shall shed its rays upon the path of the farmer; and in proportion as "mind, the grand source of intellectual pleasure, the master power which abridges labor," shall be exerted on the pursuits of agriculture, the character and dignity of the profession will be advanced, the sources of national strength will be developed, and the indications of moral improvement will be visible in the public countenance. If it be contended that the plans which are in progress for the improvement of the soil partake of the character of experiments, and that therefore the legislature should pause in granting aid, we may derive an instructive lesson from the history of the growth of cotton and of sugar. Fifty years ago it was not known that cotton would grow in the United States, but the experiment received the fostering care of government, and from only 200,000 pounds being exported in 1791, more than *four hundred millions* are exported at the present time. Then, its production was limited to one state—now, it is the staple of seven, regulating by its price nearly every other production, and supplying, in addition to our own great and increasing demand, two-thirds of all that is used in foreign climes. Indeed, the culture and manufacture of cotton have now become the support of more than ten millions of the human race in Europe and America, and of more than fifty millions in Asia and Africa. A more recent experiment in Maine and Massachusetts, has served to exhibit the value of legislative encouragement in aid of agriculture effort. Maine granted a bounty to the growth of wheat of $150,000, and a large bounty was given by Massachusetts upon the same article, at a period when her consumption of imported flour amounted to $7,000,000. It is now ascertained that both these states will be able to export flour—the policy having originated from the supposed fact that their inhospitable soil and climate would not produce grain; but intelligent, scientific agriculturists, men whom the ignorant stigmatize as "*book farmers*," acted upon a different opinion, and its truth has been demonstrated in the fact that wheat has been successfully grown in Maine, further north than Massachusetts, thus presenting another instance of the soundness of the maxim that experiment is the mother of improvement and improvement is the true source of wealth.

I cannot exaggerate to myself the importance which a free people should attach to agricultural periodicals and to agricultural education. All the valuable improvements in husbandry have been the result of scientific effort and of the wide spread dissemination of the opinion which the writings of the most eminent Romans inculcated, that the cultivation of the soil and of elegant letters were not incompatible pursuits. By the application of the physical sciences, the wonderful creation of modern times, agriculture has become not merely a mechanical employment, but a science founded upon the process of induction from ascertained facts, and if a medical institute be entitled to legislative regard, the claims to a bounty for an agricultural education are equally imposing, science being alike beneficial to both—the one to preserve and prolong life, the other to nourish it and multiply its comforts. The public mind should be excited to the tone which prevailed in ancient Sparta, of regarding the children of the republic as the property of the republic, as the materials of our temple of freedom, erected upon the principle of teaching the hands to *work* and the mind to *think*. In reference to this vital interest, the late De Witt Clinton indulged in a prophecy in his last message to the legislature of New-York, which the experience of the schools in Prussia and other German states has since fulfilled. He said, that "by a proper system of education and correct modes of teaching, our children might become familiar with the physical sciences, botany, mineralogy, the various classes of animals, chemistry, natural philosophy, astronomy, the fundamental principles of agriculture and political economy, and much of history and biography."

The endowment of agricultural schools and the circulation of agricultural journals is rendered the more necessary from a consideration of the peculiar habits and modes of thinking prevalent among our farmers. As a class of people they have little intercourse with each other; they do not preserve the result of their experiments in books, like mechanics and manufacturers; they have rarely held conventions to concentrate into a focus the lights of the day, to be thence imparted through the press to the remotest ends of the republic; they entertain an unworthy prejudice towards the attainments of book farming; they profess to be too old to seek or to receive information upon the great business of their lives, and therefore we must look to the means which shall enlighten the rising generation for any hope of future high attainments in agricultural knowledge. In designating the source of these unpropitious notions among our farmers, we shall perceive at once the pernicious influence of their reluctance to read agricultural journals; and as if they had designed to set at nought all the maxims of common prudence, we find them encouraging and sustaining nearly one thousand political papers, whilst not more than twenty papers devoted to agriculture are supported by a class whose numbers and importance are in the inverse ratio of their distinctive journals.—The farmer is content to meet his neighbor at the court yard, at the muster, at the election, and occasionally at the fireside in the winter, to converse about his farm and its products, and sometimes about the reason of different modes of cultivation, but he will reject a newspaper devoted to agriculture, which conveys to him the concentrated experience of all the intelligent and practical farmers who have lived in every country and in every age, and cannot be persuaded to realize that in persuing the pages of the N. Y. Cultivator, the Genesee Farmer, the Farmer's Cabinet, of Penn., the Farmer's Register of Va., the Buckeye Ploughboy, of O., and the Maine Farmer, the N. E. Farmer, the Farmer and Gardener of Balt., and the Franklin Farmer, he is conversing at his leisure with those in every age who have made farming both a science and a business. In view then of these facts, who can estimate the vast amount of every species of improvement in cultivation, the results of individual exertion for ages, that has been lost for the want of convenient methods of communication; or who would now attempt to calculate the addition that has been made to our stock of agricultural knowledge and wealth by the publications which are now diffusing their light all over the country?

As an evidence of the deep necessity for the adoption of some stimulating measures in relation to our agricultural condition, we have only to advert to the crop which is annually produced in Kentucky, not exceeding upon an average 35 bushels of corn, 12 of small grain, 500 lbs. of hemp and one ton of hay to the acre; and whilst the Atlantic States present the humiliating spectacle of importing hay and oats from Scotland, eggs from France, potatoes from Ireland and Germany, and bread stuffs from every country in Europe, Kentucky imports clover and timothy seed from Wheeling and Ohio, and seed Irish potatoes from Pittsburg. How few among us understand the amount which an acre *perfectly cultivated*, will produce. How few understand the secret of producing the greatest result without deterioration to the soil; the object being not merely to obtain the greatest crops for a few years, but the largest annual returns compatible with the increasing value of the soil. And how few now realize the startling fact that a farmer from Flanders would support his family by the cultivation of the fence corners now in weeds upon any of the large farms in Kentucky.

These reflections, gentlemen, are submitted to you in the hope that we may all begin to learn something of our duty, and I shall be more than compensated if they shall have the auspicious effect of leading my brother farmers to *think*, and the legislative authority to *act* in relation to the great interest upon the prosperity of which every other depends; for the sentiment of Dean Swift is not less true now than when first published, "that whoever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before, would deserve better of mankind and do more essential service to his country, than the whole race of politicians together."

Allow me then, in conclusion, to appeal to your pride of character, to your patriotic feelings and to your patriotic energies, by addressing to you the language once applied to our profession by that ripe scholar and able financier, who has since won golden opinions for himself as President of the Bank of the United States. "In this nation, agriculture is probably destined to attain its highest honors. The pure and splendid institutions of this people have embodied the brightest dreams of those high spirits who, in other times and in other lands, have lamented or struggled against oppression; they have realized the fine conceptions which speculative men have imagined, which wise men have planned, or brave men vainly perished in attempting to establish." * * "The American farmer is the exclusive, absolute, uncontrolled proprietor of the soil. His tenure is not from government. The government derives its power from him. There is above him nothing but God and the laws; no hereditary authority usurping the distinctions of personal genius; no established church spreading its dark shadow between him and and heaven. But his character assumes a loftier interest by its influence over the public liberty. It may not be foretold to what dangers this country is destined, when its swelling population, its expanding territory, its daily complicating interests, shall awaken the latent passions of men, and reveal the vulnerable points of our institutions. But whenever these perils come, its most steadfast security, its unfailing reliance, will be on that column of landed proprietors—the men of the soil and of the country, standing aloof from the passions which agitate denser communities, well educated, brave, and independent—the friends of the government without soliciting its favors, the advocates of the people without descending to flatter their passions; these men, rooted like their own forests, may yet interpose between the factions of the country, to heal, to defend and to save."

On the Preservation of the Fruits of the Earth by Drying.

[*From Chaptal's Chemistry Applied to Agriculture.*]

In all vegetable products, water exists in two different states, one part of it being found free, and the other in a state of true combination: the first portion, not being confined except by the covering of the vegetable, evaporates at the temperature of the atmosphere; the second is set free only at a temperature sufficiently high to decompose the substances containing it: the first, though foreign to the composition of the vegetable, enters into every part of it, dissolving some of its principles, serving as a vehicle for air and heat, and being converted by cold into ice: by these several properties it greatly facilitates decomposition: the second portion, from which no evil of the kind arises, is found combined and solidified in the plants, and its action is thus neutralized. Drying, then, consists in depriving the product to be preserved of the water contained in it in a free state, by heat; and from what has been observed above, it follows, that too great a degree of heat must not be applied, as, in consequence, the taste and the organization of the substance would be changed by a commencement of the decomposition of its constituent principles: the temperature should never be higher than from 35° to 45° of the centigrade. (= from 95° to 113° Fahrenheit.)

Drying can be performed either by the heat of the sun or in stove rooms. In the southern climates the heat of the sun is sufficiently powerful to dry the greater part of the fruits, and thus to preserve them unaltered: the drying is effected by exposing them to the rays of the sun upon hurdles or slates, where they will be protected from rain, dust, and injury from animals. Practice alone is sufficient to enable one to judge of the degree, to which each kind of fruit must be dried in order to its preservation.

When the outer skin or rind of the fruit is of a kind to prevent the water from passing off freely, incisions are made in

the rind to faciliate its evaporation. In this manner are prepared most of the dried fruits, which form so considerable an article of commerce between the south and north.

Those fruits which contain much sugar, as prunes, figs, musk grapes, &c. may be prepared in the above manner, and preserve nearly all their qualities, but the acid fruits acquire a disagreeable sharp taste by the concentration of the juices; some of them, however, may be kept advantageously in this way.

In the hottest countries the process of drying is often commenced by subjecting the fruits to the heat of an oven, after which they are exposed to the sun; some kinds of fruits are thrown into a weak ley, till their surface becomes wrinkled, when they are taken out, carefully washed in cold water, and afterwards dried in the sun: cherries particularly are treated in this manner. When the heat of the sun is not sufficiently great to evaporate all the water contained in the pulp of large, fleshy fruits, they may be cut in pieces and then dried: in this manner apples and pears are prepared for keeping.*

But this method is neither speedy nor economical enough for such preparations as have but little value in commerce, and which can never supply, for domestic purposes, the place of those whole fruits, which may be easily preserved from one season to another: it is therefore customary to perform the drying either in stove rooms or ovens. In the first case, the fruits, after being cut, are placed upon hurdles arranged in rows in a chamber heated to 112°: in the second, the fruits are put into an oven, from which bread has just been drawn; this is repeated if the fruits be not sufficiently dried the first time.

Some of the fruits referred to above, may be dried without being cut: of this kind are the tender pears, which cannot be preserved fresh through the winter; such as the rousselet, the butter pear, the doyenné, the messire-jean, the martinsec, &c. These are first peeled, and then thrown into boiling water, after which they are put upon hurdles into an oven heated less than is required for bread; after an interval of three or four days the pears are again exposed to the same degree of heat, having been however first flattened between the palms of the hands, whence they have acquired the name of *pressed pears.*

Fruits prepared in either of the above ways are susceptible of fermentation upon being soaked in water, and they thus serve to make a cheap and useful drink.

In those countries where these fruits abound, the drying of them is commenced about the first of August, and those are made use of, which then fall from the trees; in autumn, when the harvest is gathered in, the soundest and finest fruits are carefully selected to be used fresh, whilst the rest are dried and preserved in a place free from moisture, to be employed in making drinks. I shall in another chapter speak of the processes by which this is effected.

The herbage, which serves as food for domestic animals, can be preserved only by drying, and this in all countries is practised at the time of cutting. Fodder, which is imprudently stacked up whilst still damp, ferments, and the heat thus produced is sufficient to change the quality, produce mouldiness, and is sometimes even great enough to set the whole on fire.

There are some fruits, which may, by a few slight precautions, be preserved throughout the year. The first of these precautions is, that of depriving their surface of all moisture before putting them up; and the second consists in keeping them in dry places, where the temperature will constantly be between 50° and 54° Fahrenheit: the third, in separating the fruits, so that they shall not come in contact; I have seen apples preserved in this manner eighteen months. It is necessary to be particular in selecting fruit for preservation; that only should be taken which is perfectly sound.

Wood and other portions of vegetables, and various animal substances are likewise preserved by drying; this process increases their hardness and renders them less accessible to the action of air, insects, and other destructive agents.

The process of drying is not confined to preserving fruits from decomposition: it furnishes the means of securing their juices unaltered for the formation of extracts of them.

When the juices of plants can be extracted by pressure alone, it is only necessary to evaporate these juices at a due degree of heat and in suitable vessels, till, being deprived of all the water which retained them in a liquid state, they are reduced to dryness. Evaporation, if continued for a long time at the temperature of boiling water, changes these juices a little; the albumen, which is contained more or less abundantly in all sweet fruits, is coagulated, and after this they are no longer susceptible of undergoing the vinous fermentation.

The must of grapes, operated upon in this manner, furnishes an extract called *raisiné*, which is an article of food both wholesome and agreeable, and which, when soaked in water, decays without producing alcohol. The fermentative power of this substance may however be restored by mixing with it a little of the yeast of beer, as this repairs the loss, which the juices had sustained by heat during evaporation.

All the juices obtained from sweet fruits may be converted into extracts and thus furnish agreeable food: the quality of the extract varies according to the quantity of sugar contained in the fruit, and the care taken in the operation: when the juices are several times clarified, and evaporation carried on in a water bath, care being taken to stir the liquid to prevent its adhering to the sides, the colour and taste of the extract or jelly obtained is far superior to that procured without employing these precautions.

The sweetest fruits, however, even the well ripened grapes of the south, contain a portion of acid, which, when concentrated by evaporation, acts upon the copper boilers in which the operation is carried on, so as to form an acetate of copper: this by producing colics, would render the use of the extract dangerous, especially at the south, where the principal article of food for children is the *raisiné*. In order to obviate this serious evil, an ancient and generally followed custom is observed: as soon as the must of the grapes begins to boil in the coppers, a bunch of keys is thrown in, and allowed to remain till the operation is completed: these keys attract the copper and become covered with the precipitate thus formed; and nothing remains in the extract but the acetate of iron, which is not injurious.

* In this country, apples, pumpkins, squashes, and peaches are kept by drying.—Tr.

I have observed that the juices of all succulent fruits might be converted into extracts, and thus preserved for use in the course of the year; but the greater part of these juices, when concentrated by evaporation, are so excessively acid as to be totally unfit for food, and they only form, when mixed with water, a very sour drink. In order to correct or conceal this acidity, these juices are boiled with an equal weight of sugar and thus made into sirups and jellies.

As it is of importance to be able to extract and preserve for domestic purposes, for pharmacy, and for the arts, certain vegetable products, which can be only very imperfectly obtained by mechanical pressure, recourse is had to other means; those liquids are made use of which will dissolve the wished for principles, and the solution is afterwards evaporated to dryness.

The fluid most generally employed for solutions is water; this dissolves the extractive matter; mucilage, sugar, and the greater part of the salts, and mixes with the mealy portions of plants; it may be applied cold or hot to the vegetables, or they may be boiled in it, according to the nature of the principle to be extracted; water will dissolve all that is soluble in them, and the extracts may be obtained from the solution by evaporation.

The resins, which are found so abundantly in some vegetables, are not soluble in water, and the place of this liquid must be supplied by alcohol, in which the plant must be digested; evaporation will separate the alcohol from the resin which it holds in solution. In order to avoid the accidents that might occur from the dispersion in the atmosphere of a very inflammable vapor, the evaporation must be so conducted that the dissolvent may be received into an alembic or close vessel.

In addition to the methods of preserving fruits by drying, and by reducing their juices to the state of sirups and jellies by natural or artificial heat, M. de Montgolfin has applied the action of the air pump with great success. I have tasted juices prepared and thickened in this manner, and I thought they were much superior to those that had been evaporated in either of the modes hitherto usually practised. I do not doubt that, when this method becomes better known, it will be generally adopted.

[*From the Domestic Encyclopedia.*]

Vegetation

Is the natural process by which plants receive their nourishment.

Naturalists have formed various conjectures, to account for the mysterious phenomena occuring in vegetable nature; and though unable to discover the primary source from which plants are enlivened, yet it is now agreed, and proved, that all vegetables originate from seeds, each of which comprehends three parts, namely: 1. The *cotyledons*, or two porous lateral bodies or lobes, that imbibe moisture: 2. The *radicle*, or *eye*, which appears between the lobes: and, 3. The *plumula*, a small round body attached to the radicle, though wholly concealed within the cotyledons, forming the part that shoots upward.

If a seed be deposited in the earth, in a favourable situation, it imbibes moisture, and evolves carbonic acid gas; but if any oxygen gas be present, it is gradually absorbed by the seed, and the farinaceous matter, contained in the cotyledons, acquires a saccharine taste. Numerous vessels then appear in the lobes which convey the nutriment to the radicle, that progressively increases in size, and at length assumes the form of a root; strikes downwards into the earth; and thence derives the nourishment necessary for the support of the future plant. Now the cotyledons shoot above the ground, become leaves, and form what botanists have termed the *seminal leaves*. Thus, the *plumula* is gradually enlarged, and rises out of the earth, spreading itself into branches, &c. after which the seminal leaves wither and decay, while the different processes of vegetation are carried on in the plant, without their assistance.

Plants are very various, and of course, the structure of each species must have many peculiarities. Trees have principally engaged the attention of anatomists. We shall therefore take a tree as an instance of that structure of plants: and we shall do it the more readily, as the greater number of vegetables are provided with analogous organs dedicated to similar uses.

A tree is composed of a root, a trunk, and branches. Each consists of three parts, the bark, the wood, and the pith.

The *bark* is the outermost part of the tree. It is usually of a green colour. If we inspect a horizontal section, we shall perceive that the bark itself is composed of three distinct bodies. The outermost of these, is called *epidermis*, the middlemost, is called *parenchyma*, and the innermost, or that next the root, is called the *cortical layers*.

The *epidermis*, is a thin transparent membrane, which covers all the outside of the bark. It is pretty tough, is reproduced when rubbed off. In old trees it cracks and decays, and a new *epidermis* is formed. Hence, old trees have a rough surface.

The *parenchyma*, lies immediately below the epidermis; it is of a deep green colour, very tender and succulent. Both in it, and the epidermis there are numberless interstices which have been compared to so many small bladders.

The *cortical layers*, form the innermost part of the bark, or that next the wood. They consist of several thin membranes, lying the one above the other; and their number appears to increase with the age of the plant.

The wood consists of concentric layers the number of which increases with the age of the part. Next the bark, the wood is much softer and whiter and more juicy than the rest, and is called *alburnum* or *aubier*. The perfect wood is browner and harder, and the layers increase in density, the nearer they are to the centre.

The pith occupies the centre of the wood. It is a spongy body, containing numerous cells. In young shoots it is very succulent, but it becomes dry, as the plant advances, and finally disappears.

The leaves are attached to the branches of plants by short foot-stalks. The whole leaf is covered with the epidermis of the plant; containing many glands.

Plants are continually increasing in size. New matter is continually making its appearance in them, and this matter they must receive by some channel or other. Plants then require food as well as animals. Now, what is this food, and whence do they derive it? These questions can only be examined by an attentive survey of the substances which are contained in vegetables, and an examination of those substances which are necessary for their vegetation.—This subject has already been treated of, under articles, *food of plants*, and *manure*. Some additional remarks shall now be given.

The analysis of vegetables affords but three essential principles, namely, *carbon, hydrogen, and oxygen*, or charcoal, inflammable air, and pure air; and the proportions between these principles form all the shades, varieties, modifications, which the vegetable creation exhibits. Analysis further shews, that vegetable fibre, when cleared of all extraneous matter, is scarcely any thing else than a congeries of carbon. But how is carbon conveyed into the body of the plant? It is well known, that pure carbon, such as is used for burning mixed with pure, dry earth, affords no nourishment to vegetables: and it is also known, that when dead plants are so far decomposed, that their texture is softened or destroyed, living vegetables imbibe all their constituent principles.—This difference appears to arise from hence, that in the last case, the carbon remaining dissolved in the oily, resinous, or alkaline principle, the water, which has the property of disjoining these natural combinations, serves as a vehicle to convey them into the vegetable system. Air, heat, acids, and even rest alone, are sufficient to precipitate the carbon; so that, the agents proper to facilitate the concretion of the fibre, and to promote nutrition, are every where to be found. The principle of life, which governs and animates every organ, suitably divides this nutritive matter. It modifies the action of external agents, and presides over all the operations of this living laboratory. Hence it is easy to see, that hydrogen, carbon, or oxygen, predominates in the plant, according to the nature of the soil, exposure and climate, and according to the proportions in which these nutritive principles are presented.

Since the only part of plants which is contiguous to the soil is the root, and since the plant perishes when the root is pulled out of the ground, it is evident, that the food of plants must be imbibed by the roots. It is highly probable that the *great* changes, at best, which the food undergoes after absorption, are produced, not in the roots, but in other parts of the plant. The sap, as Dr. Hales has shown us, ascends with such impetuosity from the cut end of a vine branch, that it supported a column of mercury 32½ inches high. It is certain that the sap ascends through the wood, and not through the bark of the tree; for a plant continues to grow, even when stripped of a great part of its bark, which could not happen, if the sap ascended through the bark.

It is impossible to account for the motion of the sap in plants by capillary attraction, or by any mechanical or chemical principles whatever; we know indeed, that heat is an agent, but its influence cannot be owing to its dilating power; for unless the sap vessels of plants were furnished with valves, (and they have no valves) dilatation would rather retard than promote the ascent of the sap.

We must, therefore, ascribe it to some other cause; the vessels themselves must certainly act. Many philosophers have seen the necessity of this, and have accordingly ascribed the ascent of the sap to *irritability*. Saussure supposes, that the sap enters the open mouths of the vessels, at the extremity of the roots; that these mouths then contract, and by that contraction propel the sap upwards; that this contraction gradually follows the sap, pushing it up from the extremity of the root to the summit of the plant.

This irritable principle is seen in many plants, particularly in the *stamina* of the barberries, which are thrown into motion when touched. *(To be continued.)*

For Burns and Scalds.—Mix in a bottle three ounces of olive oil and four ounces of lime water. Apply the mixture to the part burned five or six times a day with a feather.—Linseed oil is equally as good as olive oil.

Young Men's Department.

Chemical Catechism—Chapter IX.

[*From Parkes' Chemical Catechism.*]

OF SIMPLE COMBUSTIBLES.

What is a simple substance?

Those bodies* which have never yet been decomposed, nor formed by art, are called simple substances.

How many simple substances are there?

Very lately the simple substances were said to amount to more than 50 in number;† but since the truly interesting and very important discoveries of Sir Humphrey Davy, it is scarcely possible to say what substances are not compound bodies.

Can you enumerate what are now deemed simple substances?

All the simple substances that we are acquainted with are fifty-two;‡ viz: electricity, magnetism, light, caloric, chlorine, oxygen, nitrogen, iodine,§ the metals, (reckoning as such the

* The most minute particles into which any compound substance can be divided similar to each other, and to the substance of which they are parts are termed the *integrant* particles: thus the smallest atom of powdered marble is still marble; but if by chemical means the calcium, the carbon, and the oxygen of this marble be separated, we shall then have the *elementary* or constituent particles.

Suppose a little common salt were reduced to powder, even though it be ground as fine as could be effected by art, still every single particle, however minute, would consist of a particle of sodium and a particle of chlorine; common salt being a compound body incapable of decomposition by mechanical means. But if we take a piece of sulphur and pulverize that in the same way, every particle will be a homogeneous body, sulphur being one of the simple substances.

† If these substances were all capable of combining, the compounds formed by them would amount to many thousands; but several of them cannot be united by any means we know of.

‡ Of these simple substances it may be remarked that four are imponderable; four others exist in a gaseous state; six are bases of acids; and thirty-eight are metallic bodies.

§ Iodine is a peculiar substance procured from kelp; it pos-

bases of potash, soda, and some of the earths,) and the simple combustibles, carbon, phosphorus, sulphur, hydrogen,* boron, and fluorine.

Is it well ascertained that these are all simple substances?

It is extremely probable that some of these bodies may be compound, but as no mode has yet been discovered of decompounding any of them, it will be more conducive to science, to consider them, for the present, as simple undecomposable bodies.

Having already examined the nature of all these substances, except the combustibles, we shall now enter upon the consideration of that class of bodies.—Endeavor, therefore, to enumerate the simple combustibles.

Besides the metals there are six simple combustibles, viz: hydrogen, sulphur, phosphorus, carbon, boron, and fluorine.

Why are these substances called simple combustibles?

They are called simple because we have no proof that they are compounded: whereas oil, spirit of wine, wax, tallow, and other combustible bodies, are well known to consist of two ingredients at the least.

It will be necessary to examine each of these substances separately;—therefore, what is the nature of hydrogen.†

Hydrogen is the basis of what has been generally called inflammable air,‡ and is one of the component parts, of water,§ but it cannot be exhibited in a separate state. We therefore know it only in combination with other substances,‖ or in the gaseous form, that is, with caloric.¶

In what other compounds is hydrogen an ingredient?

Hydrogen gas may be combined with water, sulphur, phosphorus, or with carbon.

What is the nature of the compound of hydrogen and water?

Water may be made, by pressure, to absorb a considerable portion of hydrogen gas. It is called hydrogenated water, and is said to be useful in medicine.

What is the nature of the compound of hydrogen and sulphur?

Sulphur dissolved in this gas forms sulphuretted hydrogen gas, which is a very fetid elastic fluid, somewhat heavier than atmospheric air and soluble in water.

What are the properties of sulphuretted hydrogen gas?

SULPHURETTED HYDROGEN gas** is transparent and colourless; it has the property of inflammability, is nauseous to the taste as well as fetid to the smell; it possesses all the characters of an acid: it combines with earths, alkalies, and with several of the metallic oxides; and forms with them those substances called *hydrosulphurets*.

What are the properties of the hydrosulphurets?

The HYDROSULPHURETS are generally soluble in water, and their solutions precipitate the metallic oxides, from metallic solutions. Exposure to the air, however, decomposes these hydrosulphurets when dissolved in water,* and partially converts them into hydroguretted sulphurets.

How many compounds are there of sulphur and hydrogen with the alkaline and earthy bases?

There are three distinct combinations of sulphur and hydrogen with the earths and alkalies, which differ in their properties in consequence of the difference there is in the proportions in which their constituent parts are combined.

Can you explain what difference there is in the composition of these three distinct classes of substances?

The first, which are called *sulphurets*, are merely compounds of sulphur united with some earthy or alkaline base; the second, called *hydrosulphurets*, are formed by the union of some base with sulphuretted hydrogen; and the third called *hydroguretted sulphurets*, consist of a base united with supersulphuretted hydrogen.

What is the nature of supersulphuretted hydrogen?

SUPERSULPHURETTED HYDROGEN is merely sulphuretted hydrogen combnied with an additional proportion of sulphur; that is to say, one part of hydrogen combines with 15 parts of sulphur to form sulphuretted hydrogen, and with 30 parts of sulphur to constitute supersulphuretted hydrogen.

What is the nature of the combination of hydrogen and phosphorus?

Hydrogen gas when combined with phosphorus forms *phosphuretted hydrogen gas*. This gas has a fetid putrid smell, and takes fire whenever it comes in contact with atmospheric air.

What is the nature of the combination of hydrogen with carbon?

This elastic substance, which is called *carburetted hydrogen gas*,† is carbon dissolved in hydrogen; it has likewise been called heavy inflammable air. It is this gaseous compound which has occasioned so many dreadful accidents in coal-pits. The miners call it the *fire-damp*.‡

What is meant by SUPER-CARBURETTED HYDROGEN?

This is a gaseous compound of carbon and hydrogen, containing exactly twice as much carbon as the carburetted hydrogen gas. It is extremely inflammable, and emits more light during combustion than is given out by the inflammation of that gas. It has been called *olefiant gas*.

What is the origin of SULPHUR?

Sulphur is found in most parts of the world§ combined with metals, from which it is procured by roasting; it also flows from volcanos; it is sublimed from the sulphurous grounds in Italy, and is found in many mineral waters,‖ combined with hydrogen.

What is the nature of sulphur?

Sulphur or brimstone as it is sometimes called, is a solid, opaque, combustible¶ substance, of a pale yellow colour, insoluble in water, very brittle, and possessing a peculiar taste and smell. Its specific gravity is 1.990, or nearly twice as heavy as water, and it is a non-conductor of electricity.—It has various uses in medicine and the arts.

*What compounds** are formed by means of sulphur?*

Sulphur is the base of several compounds; it unites with oxygen, hydrogen, carbon, phosphorus, the alkalies, the metals, and with some of the earths.*

What are the compounds of sulphur and oxygen?

If sulphur be kept in fusion in atmospheric air, it absorbs a small quantity of oxygen, and forms oxide of sulphur; if it be heated sufficiently to take fire, it burns with a pale blue flame, and becomes converted to *sulphurous* acid; but if sulphur be burned in pure oxygen, it absorbs the full dose of this gas, and *sulphuric* acid is the product.

What are the compounds of sulphur and the alkalies?

Sulphur will combine with potash, with soda, and with ammonia; which compounds possess several curious and interesting properties.

What are the general characteristics of the alkaline and earthy sulphurets?

They are hard substances of a brown colour, resembling the liver of animals; they absorb water from the atmosphere, and then emit a fetid odor, similar to that of putrid eggs.†—They have the property of decomposing water, and by that process become partially converted to alkaline or earthy sulphates.

What knowledge have we acquired of the combinations of sulphur with the earths and metals?

Sulphur may be combined artificially with most of the metals, and with some earths: but many of the metallic sulphurets are found native in great abundance.

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sesses the singular property of being convertible into a violet vapor by heat.

* If we omit the earths and alkalies (and there is abundant evidence that these are compound bodies,) most of the simple substances are combustible, or bear some relation to combustion. Light and caloric are evolved during combustion; oxygen is the principal agent of combustion: and hydrogen, sulphur, phosphorus, carbon, and the metals, are the subjects, or the true instruments of this process.

† Mr. Cavendish was the first person who examined hydrogen gas and pointed out its nature. This was in the year 1766. Dr. Black then suggested the propriety of applying it to the inflation of air balloons; and Mr. Cavallo was the first who put it in practice. This gas is about thirteen times lighter than atmospheric air.

‡ Like all other combustibles, hydrogen will not burn unless in contact with atmospheric air, or some substance that contains oxygen. If a portion of atmospheric air be mixed with this gas, and fire be applied, it will explode with violence. It is related of Pilatre de Rosier, that having mixed one part of common air with nine parts of hydrogen gas, and drawn the mixture into his lungs, it caught fire by accident as he respired it, and the whole of the gas exploded in his mouth and nearly deprived him of life. The shock was so violent, that at first he thought the whole of his teeth had been driven out, but fortunately he received no lasting injury.

§ Hydrogen is the most inflammable substance we are acquainted with; that is, it combines with more oxygen than any other body, and occasions more heat by its combustion. It may be remarked that oxygen is *mild* when in the proportion of 21 per cent in atmospheric air, and highly *corrosive* in the proportion of 74 per cent in nitric acid or even in that of 49 per cent in sulphuric acid:—How is it then, that it is found in the ratio of 88 per cent in water, and that this compound, compared with the others, should be perfectly mild and innocent! Instances of a similar accommodation of the elementary substances have been adduced; and though we cannot comprehend the nature of their operation, we can perceive that the ultimate end of the Creator is our convenience and happiness. See pages 48 and 160. Most oxidized substances, when taken internally, act perceptibly on the system; yet water, the most oxidized of all others, has comparatively little influence, because its oxygen is so forcibly retained and so completely neutralized by the hydrogen. Had it been otherwise, what is now the most salubrious beverage would have operated as a corrosive poison.

Oil, tallow, wax, &c. used for producing light, do all acquire their power of burning *with flame*, from the hydrogen, which is a component part of all these substances.

‖ Although hydrogen when in an aërial form is the lightest of all known substances, yet when imbibed by living vegetables it becomes a solid, so as to form wax, resin, &c. and in combination with oxygen it constitutes water, which has the property of becoming either solid, fluid, or aëriform.

¶ A mixture of oxygen and hydrogen gases produces the most powerful heat yet known.

** This gas was long known by the name of *hepatic gas*, because the substances from which it was first obtained were called *hepars* or livers of sulphur.

When this gas is set on fire in contact with oxygen gas, it burns with a pale blue flame without exploding. It will of itself extinguish burning bodies, and destroy animals which are made to inhale it.

Sulphuretted hydrogen gas is decomposed by atmospheric air. The oxygen of the atmosphere combines with the hydrogen and forms water, while the sulphur is precipitated.—The sulphur which is found in the neighborhood of mineral springs originates from this cause.

The fetid smell which arises from house-drains is owing, in a great measure, to a mixture of this gas with other putrid effluvia. As the diffusion of this noxious matter within our dwellings tends to produce disease and mortality, it cannot be too generally known that a cheap and simple apparatus has been contrived for carrying off the waste water, &c. of sinks, and which at the same time prevents the possibility of any air ever returning back into the house from thence, or from any drain which may be connected with it. It is known by the name of a *stink trap*, and may be had of some of the ironmongers in London. [Chloride of soda will do this; see Cultivator for Sept.]

* The waters of Harrowgate, Aix la Chapelle, and others of a similar nature, owe their medicinal properties to sulphuretted hydrogen gas and muriate of soda. The *salt of bitumen* of the Hindoos, which is almost the only article of Hindoo physic, and is sold in every village, is chiefly composed of muriate of soda and sulphuretted hydrogen. It is taken by these people for every complaint. The farriers give it to the horses, and seem to understand the principle upon which it acts; for when they have given a dose to the animal, they always give him water to extricate the gas.—Henderson on *Hindoo Physic*.

† In hot weather this gas is formed at the bottom of stagnant waters, and may readily be collected at their surface, by suspending a bottle of water over the pool, similar to the decanting of gases over a pneumatic trough, and stirring up the mud to disengage the carburetted hydrogen.

This gas generally contains a portion of carbonic acid mixed with it. Both these aëriform fluids are produced by the decomposition of water by putrid animal and vegetable matter. Such decompositions take place chiefly when the sun shines upon these waters, caloric being necessary to all gaseous compounds.

‡ What renders this gas so extremely dangerous in mines is the circumstance that whenever the atmosphere of a mine becomes charged with more than one-thirteenth of its volume of carburetted hydrogen gas, the whole becomes explosive. It is, however, now expected that the safety-lamp of Sir Humphrey Davy, which is a most important discovery, will be a means of lessening the number of these accidents.

§ Sulphur is procured in large quantities from martial pyrites and other metallic ores. It is also found in abundance in the state of native sulphur, as it is called, near several volcanos, in different parts of the world. According to Dr. Anderson, there are mines of it in the kingdom of Thibet.

‖ Sulphur has been discovered in cresses, horse-radish, and several other vegetables. It is also evolved from animal substances, during their putrefaction, in combination with hydrogen. The change which silver undergoes when immersed in an egg, shows the presence of sulphuretted hydrogen.

¶ Sulphur during its combustion combines with oxygen, and becomes an incombustible substance. Like phosphorus, it is eminently combustible, owing to its great affinity for oxygen.

*** "Nature employs sulpher in a great number of her operations; she presents it under many forms among fossils; charges with it the waters denominated sulphurous; mineralizes with it the metals; causes it to pass into vegetable and animal fibres and exhibits it to chemists in an infinite number of combinations."

* Sulphur is used in large quantities for making gunpowder. When exhibited as a medicine, it penetrates to the extremities of the most minute vessels, and impregnates all the secretions; as may be perceived by those who have taken it for any length of time. Sulphur has many uses in the arts, and has been employed with advantage in stopping the progress of fermentation in wines and other fermented liquors.

† Sulphuret of potash is formed by the explosion of gunpowder, and it is this compound which occasions that peculiar smell which a gun usually has after firing.

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*Moneys received between the 1st of August and 20th Sept. in sums of $5 and over. The total receipts are included from post-offices marked with an asterisk.**

		No. Vols.			No. Vols.
*Alexandria,	D.C.	52	Lindleystown,	N.Y.	5
*Akron,	O.	7	*Lexington,	Va.	28
Atwater,	O.	7	*Milton,	N.Y.	15
*Boston,	Mass.	195	*Marlborough,	N.Y.	9
*Burlington,	Vt.	26	*New-York mills,	N.Y.	20
*Baltimore,	Md.	115	*New-York city,		310
*Buffalo,	N.Y.	21	*New-Brunswick,	N.J.	32
*Buskirk's Bridge,	N.Y.	13	*New-Haven,	Ct.	35
*Carrolton,	Ill.	10	*New-Lisbon,	O.	19
Cordova,	Ill.	7	Norwich,	Ct.	6
Clarksfield,	O.	5	Oxford,	O.	5
*Cincinnati,	O.	27	*Oswego,	N.Y.	28
*Chicago,	Ill.	10	*Providence,	R.I.	9
Catfish,	S.C.	5	*Philadelphia,	Pa.	160
*Catskill,	N.Y.	21	*Poquonock,	Ct.	12
*Columbia,	S.C.	21	*Paterson,	N.J.	11
Elberton,	Ga.	5	*Princeton,	N.J.	16
Fort Madison,	Io.T.	11	Pittsburgh,	Pa.	79
Farmington,	O.	7	*Poughkeepsie,	N.Y.	23
*Flushing,	N.Y.	19	Pilot Grove,	Mo.	10
*Greeensborough,	Ga.	16	*Quincy,	Ill.	10
*Geneva,	N.Y.	34	Quebec,	L.C.	7
*Hartford,	Ky.	11	*Richmond,	Va.	198
Huntington,	Ia.	6	*Rhinebeck,	N.Y.	35
*Hartford,	Ct.	63	Rockaway,	N.J.	6
*Jonesborough,	Mo.	23	*Savannah,	Ga.	56
*Johnson's Springs,	Va.	47	*Schenectady,	N.Y.	24
*King George C. H.	Va.	20	*St. Louis,	Mo.	67
Lower Marlboro',	Md.	5	*Steubenville,	O.	26
*Lafayette,	Ia.	16	Sing-Sing,	N.Y.	26
*Lexington,	Ky.	29	*Troy,	N.Y.	40
*Liberty,	Va.	20	*Verdiersville,	Va.	7

PRICE CURRENT.

ARTICLES.	New-York, Sept. 18.	Boston. Sept. 18.	Philadelphia. Sept. 17.	Baltimore. Sept. 17.
Beans, white, per bushel,......	2 12— 2 25	1 75— 3 00	1 75— 1 87	1 80— 1 90
Beef, per cwt..................	....	7 00— 8 50	7 00— 9 00	7 25— 7 75
Bacon, western, per lb.........	0 12— 0 13	0 12— 0 12	0 10— 0 11	0 11— 0 12
Butter, fresh, per lb..........	0 16— 0 25	0 17— 0 28	0 14— 0 16	....
Cheese, per lb.................	0 08— 0 10	0 10— 0 12	0 10— 0 11	....
Cotton, best per lb............	0 10— 0 14	0 09— 0 11	0 13— 0 16	....
Flour, best, per barrel, ...	6 50— 7 00	6 50— 7 00	6 00— 6 25	5 75— 6 00
GRAIN—Wheat, per bushel,....	1 30— 1 33	1 28— 1 33	1 30— 1 35	1 11— 1 18
Rye, per bushel,......	0 84— 0 85	0 83— 0 85	0 73— 0 83	0 73— 0 75
Oats, per bushel,......	0 38— 0 47	0 35— 0 37	0 33— 0 40	0 30— 0 34
Corn, per bushel, ...	0 85— 0 88	0 80— 0 97	0 75— 0 80	0 60— 0 65
Hams, pork, per lb............	0 10— 0 13	0 13— 0 14	0 08— 0 11	0 10— 0 11
Pork, in hog, per cwt..........	....	6 50— 7 50	7 00— 8 00	9 00— 9 50
SEEDS—Red Clover, per bushel,	....	08 00—12 00	....	....
Timothy, per bushel,..	....	2 87— 3 00	....	....
WOOL—Saxony, fleece, per lb..	0 55— 0 58	0 60— 0 65	0 55— 0 60	....
Merino, per lb........	0 50— 0 53	0 55— 0 60	0 50— 0 55	....
¼ and common, per lb..	0 37— 0 42	0 45— 0 50	0 38— 0 42	....
Sheep, per head,....	2 00— 5 50	1 25— 3 25	1 50— 4 25	1 50— 3 25
Cows and Calves, each, ...	28 00—30 00	30 00—60 00	30 00—50 00	....

MULBERRY TREES.—25,000 Multicaulis, Alpine and Expansa Mulberry trees, and a few thousand Silk Worms Eggs, for sale by S. E. GIBBS & SON, West end of Long-Island.
Address them at Brooklyn. October, 1839. 3t.

DURHAM CATTLE.—Short-Horned Durham Cattle, of pure blood, bred by Charles Henry Hall, of N. York, comprising Bulls, Cows and Heifers, of all ages. In point of excellence, the proprietor of these cattle will not hesitate to compete at any fair with those lately imported from England, or with any others bred in this country. Their size, beauty of form, and their milking properties, are seldom equalled. Some of these animals have taken premiums, and among them the gold and silver medals of the American Institute, for two successive years.

For terms, examinations, and pedigrees, apply to the subscriber at Greenbush, Rensselaer county, where the animals are; or to DANIEL A. WEBSTER, No. 67 State-street, Albany. Greenbush, Sept. 2, 1839.
oct.2t WILLIAM DEWEY, Agent.

DURHAM AND DEVONSHIRE CATTLE and SAXONY SHEEP, for sale by the subscriber.

1. The Bull *Memnon*, from the herd of F. Rotch, Esq. of Butternuts, N. Y. Pedigree No. 2,297, English Herd Book.
2. A four years old full blood Cow, a beautiful specimen of the Devonshire and Durham cross, with her calf, a heifer, six months old, by Memnon.
3. A bull calf, two and a half months old, by Memnon, dam Experiment.
4. From 70 to 80 Ewes, 40 to 50 Lambs, and 30 Rams, from my flock of full blood Electoral Saxon Sheep, selected by myself from the purest race in Saxony. H. D. GROVE,
oct.1t Buskirk's Bridge P. O. Wash. co. N. Y.

PURE SOUTH-DOWN SHEEP.—The subscriber will sell at public auction on Thursday the 10th day of October next, at the city of Rochester, sixty-five full blooded South-Down Bucks and Ewes. Some of them have been imported by himself direct from England, and with their produce are not surpassed by any of the same breed in this country. Every sheep offered will be sold without reserve to the highest bidder, and a warrantee certificate given to the purchaser.

The place of sale being in Rochester, the sheep can be shipped to any part of the country desired.

Persons wishing to see the above sheep, can, at any time, previous to the sale, by calling on the subscriber at his residence in Riga, Monroe county, N. Y.

This breed of sheep needs no recommendation to those who are acquainted with them; they are the strongest constitution, easiest kept, apt to fatness, very quiet, less liable to disease, than any other breed of sheep.
oct.1t JAMES PARSONS.

MORUS MULTICAULIS.—25,000 trees for sale, either in quantities or all together, and to be delivered at any time that may best suit the purchaser. They are from imported cuttings, of the genuine Morus Multicaulis, were planted in May last, and are of the most vigorous growth, measuring from three to five feet in heighth, with large collateral branches. Purchasers are invited to call and see them, at the residence of Gen. Morgan Lewis, Staatsburgh, Dutchess county, state of New-York, where the owner lives, as he thinks they will not suffer by a comparison, with any in the United States. Staatsburgh, Dutchess co. Sept. 11, 1839. [oct. 4t] MATURIN LIVINGSTON.

MULBERRY TREES.—A few thousand Mulberry Trees are for sale at the Albany Nursery. They consist of the Multicaulis, Brussa, Chinese, that is, the product of Chinese seed, and the common white. The prices will depend upon size and quality. The Brussa is more hardy than the common, and the Chinese about as hardy; and the three kinds are believed to be equal, if not superior, to the Multicaulis, for silk; though it is proper to add, none of the mulberries that we have tried are propagated with so much facility, from buds and cuttings, as the multicaulis. The prices will be conformed to the average market price. tf

ALBANY NURSERY.—This establishment now offers perhaps the best collection of Pears now in the country; [see the June number of the Cultivator.] Also, Apples, Peaches, Plums, Ornamental Trees, Green-House Plants, &c. &c. A catalogue will soon be printed, and forwarded to order. Address J. BUEL & Co. post-paid. tf

ROHAN POTATOES.—Orders received for Rohan Potatoes, at $5 per Barrel, to be forwarded, as may be directed, without delay, by J. BUEL. tf

ROHAN POTATOES.—The subscriber is now prepared to furnish the above very valuable root for transportation, at $5 pr. bbl. until the 1st Nov. delivered at Albany. Persons living at a distance, will find it to their interest to forward their orders early, so they will reach their destination before cold weather sets in. Orders enclosing five dollars, (postage paid) or more, will meet with immediate attention.
CALEB N. BEMENT.
Three-Hills Farm, Albany, Oct. 1st, 1839.–3t

SOUTH-DOWN SHEEP.—The subscriber will sell the following Sheep, delivered at Albany, if applied for soon, viz: *Price*

1	full bred South-Down Buck, (imported,)	3 years old,		$80
1	do	do	1 year old,	40
6	do	do	Lambs,	30

10 do South and Hampshire Down Ewes, (some of which were imported by Mr. Hawes, in 1833,) very old, price from $20 to $25. Eight Ewes from 1 to 2 years old, half South Down and half Bakewell, price $10.

All letters, postage paid, will be punctually attended to.
2 CALEB N. BEMENT, Three Hills Farm, Albany.

FOR SALE—TWO SOUTH-DOWN BUCK LAMBS.—The subscriber imported, in the fall of 1837, two ewes and a buck, selected from the Earl of Leicester's flock, (Holkham,) of which the above is the progeny. Near Dobb's Ferry, Pa. July 28, 1839.
Sept-tf JAMES A. HAMILTON.

THE SUBSCRIBER has located in Albany, where he is manufacturing his machines for thrashing and cleaning grain. He may be found at **53 North-Market-st.** or at his machine shop on Patroon's Creek, near the Manor House. Sept. 2, 1839. [oct. 3t] JOHN A. PITTS.

FOR SALE—The subscriber wishing to close up his business, offers for sale the valuable Iron and Lumber Establishment, formerly owned and occupied by Penfield & Taft, situated on Putts creek, six miles from Lake Champlain, in Crown Point, Essex co. N. Y. The premises in question consist of a valuable water power, with a fall of more than 100 feet within sixty rods; on which there is now in operation a Grist-Mill with three run of stones, propelled by an overshot wheel; two Saw-Mills, one with overshot wheel and double gear, all nearly new and in good order; a Forge with two fires; and a machine shop for pounding and separating ore. The water for propelling these works is held in reserve by four ponds or reservoirs on the premises; the upper one being about 2½ miles in length, forming an ample reservoir for the whole works below, and affording sufficient water in itself for driving a forge with four fires and a rolling mill.

Adjoining the works are **600** acres of land, one-fourth of which is under good cultivation; on which are five dwelling-houses, convenient barns and out-houses, a store, blacksmith shop, and buildings convenient for other purposes.

There is also **1,000** acres of fine timbered land lying two or three miles from the above described works. Also, about five miles distant are **800** acres fine timbered land, on which are two Saw-Mills, and one of the richest, most extensive and valuable beds of iron ore yet found in the U. States.

Also, **1,900** acres of land in the towns of Schroon and West Moriah, Essex co. the greater part of which is covered with pine timber; 100 acres of which is under good culture, and on which is a good saw-mill, blacksmith shop, several dwelling-houses, barns and out-houses.

Also, one-half of a farm of 130 acres, situate on Lake Champlain, near the mouth of Putts creek, 2-3ds of it under good improvement; on which there is a large and convenient wharf.

On examining the above described premises, they will be found to combine unparalleled advantages for prosecuting an extensive business in the manufacture of lumber and iron, and for the sale of ore.

Such parts or parcels of the premises as are necessary for prosecuting the manufacture of iron and the sale of ore, will be disposed of separately from, or in connexion with, the lumbering establishment, as may suit the purchaser.

For the terms of sale, and all further particulars, inquire of the subscriber on the premises. ALLEN PENFIELD.

TO THE SILK GROWERS OF THE UNITED STATES.—In consequence of the difficulty of purchasing cocoons in the present state of the silk culture in this country, (competent agents for the purchase, at a distance, are not at present to be had,) and as the reeling of the cocoons is the foundation of the whole business in a national point of view, the subscriber is induced to receive cocoons from all parts of the country, to be reeled on shares, in the Italian style, for exportation; the silk to be returned to the owner, or the market price in cash, as may be desired. Persons sending cocoons for reeling, will please name for what purpose it is intended, whether for *Sewing Silk*, which requires 20 to 25 cocoons (or fibres to the thread,) or the finer qualities for weaving, say from 6 to 10, inclusive, and the product will necessarily vary with the *quality* of the cocoons. Worms poorly fed will produce light thin cocoons, and many of them so light that they will fill with water and sink, and consequently be lost. Cultivators will therefore see the importance of producing good cocoons—the largest are not always the best. The cocoons should be firm and hard to the touch. A large spongy cocoon will not yield much silk.

The terms for reeling for the present season, will be 20 per cent of the silk produced from each parcel of cocoons, which as they will be necessarily received in small parcels, will be attended with more trouble and expense than in after years, when the feeding of silk worms will be as extensively followed as is now the growing of cotton.
SAMUEL WHITMARSH.
Northampton, Mass. July 8, 1839.

N. B. The cocoons should be thoroughly *seasoned* before packing; they should not be *damp*, as they will *heat* in transportation. All bad cocoons in which the worms have died, should be rejected. They may be packed in flour barrels or boxes, with *holes* bored in the top and bottom, to give air, or in bags within crates, or in any way to prevent crushing them. They should not be crowded, but shaken into the barrels with the floss on. They may be shipped from any part of the U. States, direct to Hartford or New-Haven, Conn. whence they will be received by the canal or river boats, directed to "*Samuel Whitmarsh*, Northampton, Mass." sept-2t.

IMPORTED CATTLE—BERKSHIRE PIGS.—The subscriber intending to return to England, offers for sale his stock of Imported Durham Short Horned Cattle and Berkshire Pigs, at his residence, English neighborhood, Bergen county New-Jersey, five miles from New-York. The stock consists of 15 head of milking cows, 1 two-year old heifer, 4 one-year old heifers, and from 8 to 10 spring calves. Four of the above cows are imported, and the remainder are got by the imported Herd-Book Bulls Dishley, Durham, Wye-Comet, Hall's Comet, Memnon, Admiral, Denton, &c.

BERKSHIRE PIGS.—Ten breeding Sows, in pig and with pigs by them at the present time; from 40 to 50 Pigs ready for delivery at any time, at prices from $10 to $20 per pair, delivered in New-York.

The imported Herd-Book bred bull Bloomsbury is with the Cows for the season, and from present appearance will soon all be in calf. The yearlings and spring calves are all by my bull Snow-Ball, late Minevis, by Wye-Comet, dam Nelle, bred by Israel Munson, Esq. of Boston, got by the imported bull Admiral; grand-dam Rosa, bred by Mr. Munson, by the imported bull Denton, owned by Stephen Williams, of Northborough, Mass.; great-grand-dam Tuberose, bred by Mr. Wetherall, and imported by Mr. Munson.

For further particulars, see Herd-Book; Dishley, page 63; Durham, page 567; Wye-Comet, page 200; Admiral, page 2; Denton, page 43; Tuberose, page 524.
BENJAMIN BRENTNALL, English neighborhood,
sept-3t. Bergen co. N. J. 5 miles from N. Y.

SOUTH-DOWN BUCKS.—Two two year old very superior South Down Bucks, clothed with fine wool and long enough for combing, were imported last April, direct from England, from the flock of the late John Ellman, Esq. of Glynde, near Lewes, Sussex, and are for sale at one hundred dollars each, or to be let for the season at fifty dollars each, by the personal friend of the breeder.
OBADIAH ELLIOT.
Elizabethtown, N. J. Aug. 20, 1839. s3t

☞ The Genesee Farmer and Farmers' Cabinet, will give the above two insertions, and send bill to advertiser.

BERKSHIRE PIGS.—The subscribers are ready to receive orders for their fall litters of Berkshire Pigs.—Several of their sows will come in from the 25th of August to the 5th of September. Orders for the south can be sent to New-York every day in the week, (Sundays excepted,) and reshipped by a faithful person, without charge, except for freight to, or cartage in, New-York. Orders or letters of inquiry, *post-paid*, will receive immediate attention.
sept-2t. H. & J. CARPENTER, Norwich, Con.

ALBANY SEED STORE, GARDEN and AGRICULTURAL SEEDS, IMPLEMENTS, TOOLS, &c. kept constantly for sale at his Seed Store, 317 North Market-street, wholesale and retail, consisting of a large assortment. It is the intention of the proprietor to test all seeds of which there is any doubt respecting their vitality, by sowing a few seeds in a small pot, before offering them for sale. And purchasers can test for themselves, any seeds of which they are distrustful, by sowing a few in a box of fine earth, and placing it in a warm room, exposed to the sun, where, if kept moist, the seed, if good, will vegetate in a reasonable time. In all cases where seeds prove to be bad, they will be replaced by others, or any reasonable satisfaction made. The proprietor has enlarged his establishment and increased his supplies, and with his experience in the business, together with his facilities for obtaining supplies, through Mr. GEORGE C. THORBURN, and his extensive correspondence and facilities for obtaining seeds, he flatters himself he will be able fully to meet the wishes and expectations of the public, and make the *ALBANY SEED STORE and AGRICULTURAL REPOSITORY* worthy of the high character it has already attained.

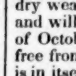
Persons ordering Seeds and Implements from a distance, with whom I am unacquainted, without remitting payment, are expected to give references in this city or New-York.
Sept-tf WILLIAM THORBURN.

NEW-YORK URATE AND POUDRETTE COMPANY, not incorporated, but carried on by individual enterprise. The manures are not divided among the stockholders, as are those belonging to another establishment, but sold to applicants for cash on delivery. Orders are supplied in the order of time in which they are received. Urate 50 cents and Poudrette 40 cents per bushel, with contingent charges for bags or barrels, &c.

The company are daily preparing for use, during the warm dry weather, the materials collected during the past winter, and will have several thousand bushels ready before the first of October next. The material is disinfected and rendered free from offensive smell by a compound, every part of which is in itself a good manure. The experience of the past and present year, 1838 and 1839, on Long Island, has satisfied many of the farmers that these manures have the quickest operation upon vegetable matter, producing greater abundance, and the cheapest of any manure they have ever tried.

Amended instructions for their use, the result of practical experience, will be furnished on application. The effect of Poudrette upon grape vines and morus multicaulis is beyond all comparison. This company are erecting large and extensive works in the vicinity of the city of New-York to prepare the manures; and farmers and gardeners may confidently rely on a supply. Orders, post paid, directed to "The New-York Urate and Poudrette Company," box number 1,-211, post-office, New-York, or sent to the store of STILLWELL & DEY, number 365, Fulton-street, Brooklyn, will be attended to. *New-York, July* 17, 1839.

The company will be very much obliged to gentlemen who have used the manures, to give them a statement in writing what has been the result of their use and experiments in relation to them. aug-4t.



FOR SALE—A Splendid Country Seat in the Highlands, on the Hudson River. That beautiful country residence, known by the name of the BEVERLY ESTATE, containing four hundred acres of land, about two hundred of which are fine level arable soil, of an excellent quality, in a good state of cultivation, and not surpassed by any on the river for fertility; the remainder is fine and thrifty timber land. The situation is the most eligible on the Hudson, extending one mile and a half on the river, with a bold shore and convenient dock, nearly opposite West-Point, and within fifty miles of New-York. The prospect is extensive and diversified, reaching from St. Anthony's Peak on the south, to the bay and city of Newburgh on the north. This estate can conveniently be divided into three farms, giving an equal proportion of front on the river, and of arable and timber land to each. Almost every enclosure is supplied with living springs of the purest water. There is on said estate a plain house, (formerly the head-quarters of Gen. Arnold;) also out-houses necessary to carry on the business of the farm. The single fact that during the whole time the cholera raged throughout the state, not one case occurred within ten miles of this place, is sufficient to prove the unrivalled salubrity of the situation. The facilities of intercourse with the city, that can be reached in four hours, by means of numerous steam-boats, are great, and daily increasing, both as regards pleasure, and the convenience of a near market for produce of every description.

For conditions of sale, apply to STEPHEN A. HALSEY, 189 Water-street, New-York, or RICHARD D. ARDEN, on the adjoining farm. Ardenia, 23d April, 1839. j6t

FROM THE STEAM PRESS OF
PACKARD, VAN BENTHUYSEN & Co.